

[<https://www.security.org/how-secure-is-my-password>]

password length is better than complexity -> passphrase

COMP.SE.100-EN ItSE

Zoom begins soon...
at 1415 o'clock.



The screenshot shows the homepage of security.org. At the top, there are navigation links for Home Security, Smart Home, Digital Security, and About Us, along with a search icon. The main title "How Secure Is My Password?" is prominently displayed in a blue header bar. Below it is a light purple bar with the text "ENTER PASSWORD". The main content area has a blue background with a central image of a smartphone displaying a password manager app. Text above the phone reads "ALL YOUR PASSWORDS, SAFE, SECURE, AND EVERYWHERE YOU GO" and a button says "Get Dashlane now". A small note at the bottom states: "This site is for educational use. Due to limitations of the technology involved, the results cannot always be accurate. Your password will not be sent over the internet." On the far right edge of the page, there is a vertical "Feedback" link.

COMP.SE.100-EN, 2020, course schedule v6d (21.10.2020)

week	lectures	exam	weekly exercises	project assignment (exercise work)	week
35	L1: course basics		--- sign to WE groups ---	sign for project = grouping...	35
36	Project Assignment explained		WE1: intro to requirements	grouping, groups to Moodle	36
37	L2: Sw Eng in general		WE2: Trello and agile way	group's Trello board ready with product backlog	37
38	L3: requirements		WE3: feasibility study and stakeholder analysis	working...	38
39	L4: basic UML diagrams		WE4: requirements	working...	39
40	L5: more UML diagrams	EXAM-1	WE5: UML diagrams - Use case	working...	40
41	L6: different sw systems	EXAM-1	WE6: UML diagrams - concept/entity and navigation	deadline for 1st phase documentation and presentation	41
42	examination week		examination week	examination week	42
43	L7: life cycle models		groups' 1st presentations	groups' 1st phase presentations	43
44	L8: quality and testing		WE7: development processes	feedback group-to-group at PRP, from 1st phase	44
45	L9: project work	Forms-2	WE8: testing and error reporting	deadline for diagrams first versions (Moodle)	45
46	L10: project management		WE9: effort estimation	feedback to groups from diagrams (from assistants)	46
47	L11: open source, APIs, IPR		WE10: delivery contracts and terms of use	deadline for 2nd phase presentation (PRP)	47
48	L12: embedded systems, IoT	EXAM-3	groups' final presentations	groups' final presentations / feedback g-to-g (PRP)	48
49	L13: recap, summary	EXAM-3	---	final (2.) delivery of project documentation	49
50	examination week		examination week	feedback inside group, student-to-student at PRP	50
51	examination week		examination week	end of game / game over.	51
	Lectures: Wed at 1415-16.		Weekly exercises:		
			Mon 0815-10 discontinued	AUTUMN 2020 (1-2. periods)	
			Mon 1215-14	are remote/distant learning.	
			Tue 0815-10		
			Tue 1415-16		
			Wed 0815-10 discontinued .		

COMP.SE.100 -EN "ItSE"

Introduction to Software Engineering

2020, 1-2. periods

5 credit units

09-projwork-ItSE-2020-v7

COMP.SE.100-EN (ItSE)
Introduction to Software Engineering

Lecture 9, 04.11.2020

Tensu: remember to start Zoom
lecture recording, at 1415

Prefer course Moodle over SISU information.

Students are recommended to follow Moodle News/messages.

Course contents (plan)

1. Course basics, intro
2. Sw Eng in general, overview
3. Requirements
4. Different software systems
5. Basic UML Diagrams ("Class", Use Case, Navigation)
6. UML diagrams, in more detail
7. Life Cycle models
8. Quality and Testing
- 9. Project work**
10. Project management
11. Open source, APIs, IPR
12. Embedded systems
13. Recap

9. Project work

- working in a project
- project meetings
- from group work to teamwork
- common problems / pitfalls
- soft skills, people = Human Potential ("human matters")
- motivation
- tools
- patterns

Current at course (w 44)

- WE8 were this week (Testing and quality)
- next week WE9
- continue updating your Trello (kanban) boards = use at your process
- feedback group-to-group at PRP, from 1st presentations, deadline was at week 44, 01.11.2020
- remember Forms-2 (diagrams) exam on week 45, Wed 04.11.2020 at 1615-, three questions = three diagrams, some diagramming tool must be used (not PowerPoint nor Paint)
- deadline for diagrams' first versions, to Moodle, this week 45

First, general course matters

Project assignment (exercise work)

Juanita: groups G01-G04

Aleksius: ODD groups; G05,G07,G09,G11,G13,G15,G17,G19,G21,G23,G27

Lauri: EVEN groups; G06,G08,G10,G12,G14,G16,G18,G20,G22,G24,G28

- Trello board is used as help for work division and assignment

WE attendees:

- Mon 0815-10 9, 8,10, 5, 6, 4,
- Mon 1215-14 11,12,12,13,11,12,10, 9,
- Tue 0815-10 3, 6, 4, 6, 5, 5,10,12,
- Tue 1415-16 8,10, 9, 8, 5, 7,12,12,
- Wed 0815-10 12,11, 9, 8, 7, 6,

Very small WEs are not reasonable, we discontinued two WE groups at 2nd study period.

Working in a project

Folklore: projects are lost in the beginning.

That means if the basics are not done well, it is very difficult to succeed in a project.

For example if goals are not clear, requirements are not thought, customer or end-user is not committed, project manager does not do the job, developer team is not set up (just gather some developers together).

(FI: projektit hävitäään alussa, projektit pilataan alkuvaiheessa)

Project work(ing)

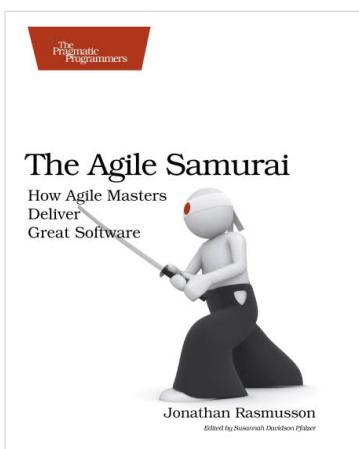
There are hundreds of books about project work, and project management.

At least 50 % of project working/management recommendations and "best practices" (patterns) are independent of the application area.

So if you get to know some good project working practices and/or ideas, those might work also at ICT projects.

In recent years the "soft skills" have got more and more attention. You know, ICT workers are humans, not machines.

Project start ("inception deck")



Many projects get killed before they even get out of the starting blocks. This is mostly because of the following reasons:

- They fail to ask the right questions.
- They don't have the courage to ask the tough ones.

The Inception Deck in a Nutshell, 1

Here's a high-level overview of the project start questions (1/2):

1. Ask why we are here.
 - This is a quick reminder about why we are here, who our customers are, and why we decided to do this project in the first place.
2. Create an elevator pitch.
 - If we had thirty seconds and two sentences to describe our project, what would we say?
3. Design a product box.
 - If we were flipping through a magazine and we saw an advertisement for our product or service, what would it say, and, more importantly, would we buy it?
4. Create a NOT list.
 - It's pretty clear what we want to do on this project. Let's be even clearer and show what we are not doing.
5. Meet your neighbors.
 - Our project community is always bigger than we think. Why don't we invite them over for coffee and introduce ourselves?

The Inception Deck in a Nutshell, 2

Here's a high-level overview of the project start questions (2/2):

6. Show the solution.
 - Let's draw the high-level blueprints of the technical architecture to make sure we are all thinking of the same thing.
7. Ask what keeps us up at night.
 - Some of the things that happen on projects are downright scary. But talking about them, and what we can do to avoid them, can make them less scary.
8. Size it up.
 - Is this thing a three-, six-, or nine-month project?
9. Be clear on what's going to give.
 - Projects have levers like time, scope, budget, and quality. What's most and least important for this project at this time?
10. Show what it's going to take.
 - How long is it going to take? How much will it cost? And what kind of team are we going to need to pull this off?

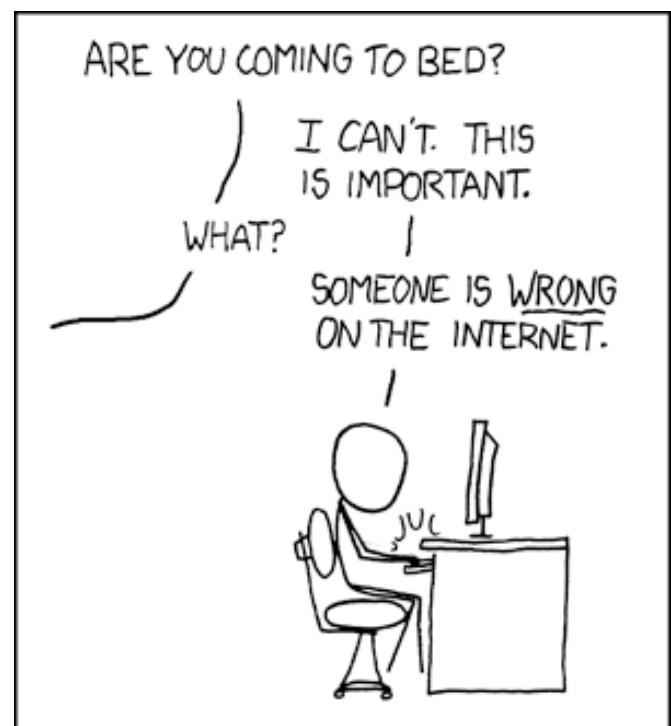
Some general advice to sw dev groups...

- coding nights / **working together happenings** ("jams") are strongly recommended
- **motivational events** after some considerable effort (e.g. deliverable deadline), e.g. sauna party or just bar night
- plan breaks = holidays well and in advance, share work to **everybody** and stick in the plan
- if you don't find a solution to a problem for 1..2 days, **ask help from your teammates**, you need not to bang your head to the wall alone many days before you dare to ask help.

There is not only one right way to do the project.

Every group (team) is different and acts differently, they make their own process.

Surely there are some more or less general guidelines and company habits.



Soft skills are personal attributes that help individuals interact with others on the job. Transferable across industries, these skills are regarded as **the combination of communication, social and interpersonal**.

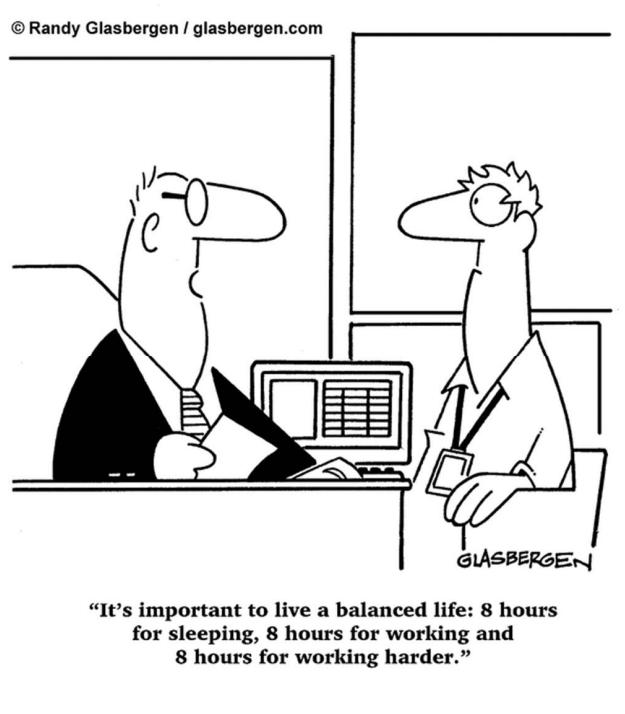
Hard skills, also referred to as "**technical skills**", are practical skills required by software engineers to build, maintain and repair software. Unlike soft skills, hard skills are industry-centric and are acquired either in school or through years of experience in the industry. Examples of software engineer technical skills include software developments, software testing and debugging as well as computer programming and coding.

Here are some **common skills** you may see listed on job posts for software engineer:

- **Communication**
- **Teamwork**
- **Computer programming and coding**
- **Problem-solving**
- **Multitasking**
- **Attention to detail.**



Make sure every groupmember knows the rules, right from the beginning



Negative characteristics in a team

- Bad attitude
- Side bar conversations
- Judgement and blame of each other
- Victim mentality
- No direction
- Personal agendas
- Lack of engagement
- Distrust
- No safe place to go
- Lack of collaboration/sharing.

Copyright 2002 by Randy Glasbergen. www.glasbergen.com

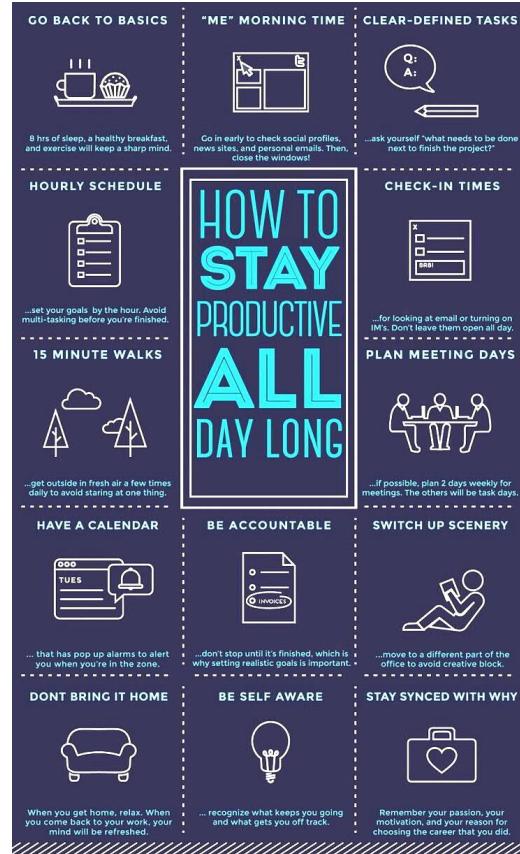


[<https://alignleadership.com/2016/02/16/what-makes-a-great-team/>]

When we act as a fully aligned team, We...

- **actively build trust with team members so that it is safe to share more of ourselves**, things that are important to us – our ideas, talents, solutions, goals. Where we fully support a decision after healthy debate and help to make it successful, whether we agree with it or not.
- **create a common vision that benefits the good of all** – our teammates, our company, our customers, and ourselves.
- **operate from a belief in mutuality** – that there is more than enough for all of us. There is an abundance of possibilities. We are willing to create in an environment that is healthy for open dialogue, making decisions, providing feedback, having accountability, and handling breakdowns.
- **take ownership for our role in any team drama** and shift it to a more empowered stance.
- **understand the context we operate in**, as it will shape our choices.
- **take risks and know that there will be bumps**, there will be falls and we will get back up.

[<https://alignleadership.com/2016/02/16/what-makes-a-great-team/>]



[<https://i.redd.it/l34pybfaiof41.jpg>]

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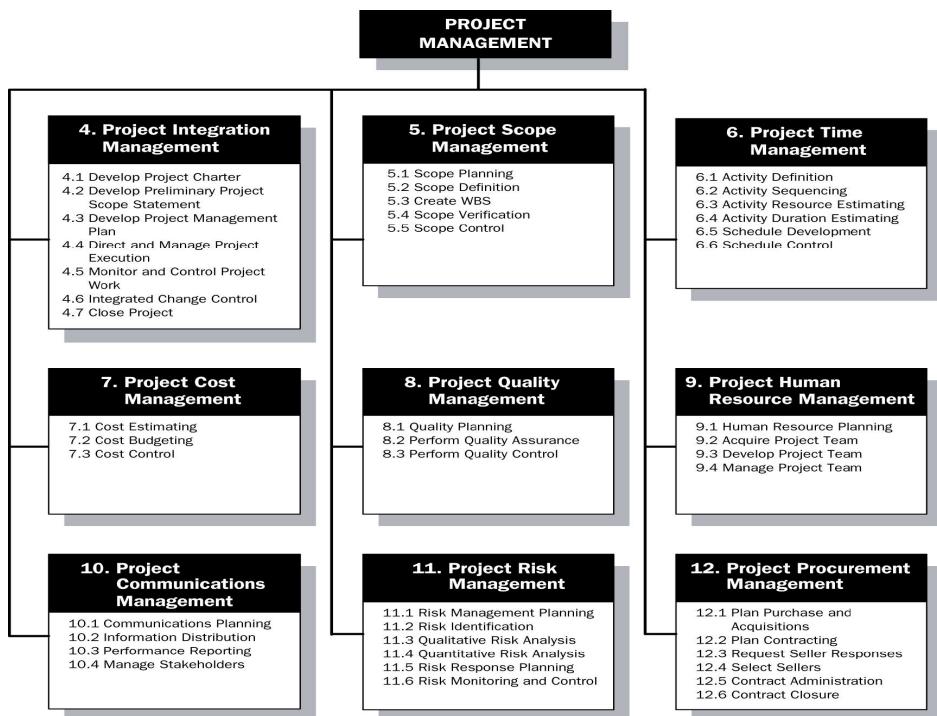


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The big picture about project areas

[Guide to PMBoK,
3rd ed, 2004]



04.11.2020

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Finnish Information Processing Association

Etusivu Tapahtumat Koulutukset Uutiset Toimiala TIVIA Jäsenyys Yrityksille

IN ENGLISH

Join TIVIA

Membership

Membership fees

Member benefits

For companies

Member Associations

Mentoring program

The Finnish Information Processing Association, TIVIA, is Finland's leading professional society in the field of information and communications technology. TIVIA society consists of the central organisation and of over 30 regional associations, nationwide theme associations and other associations. The society's members are persons, companies, other organizations and partner members who belong to member associations.

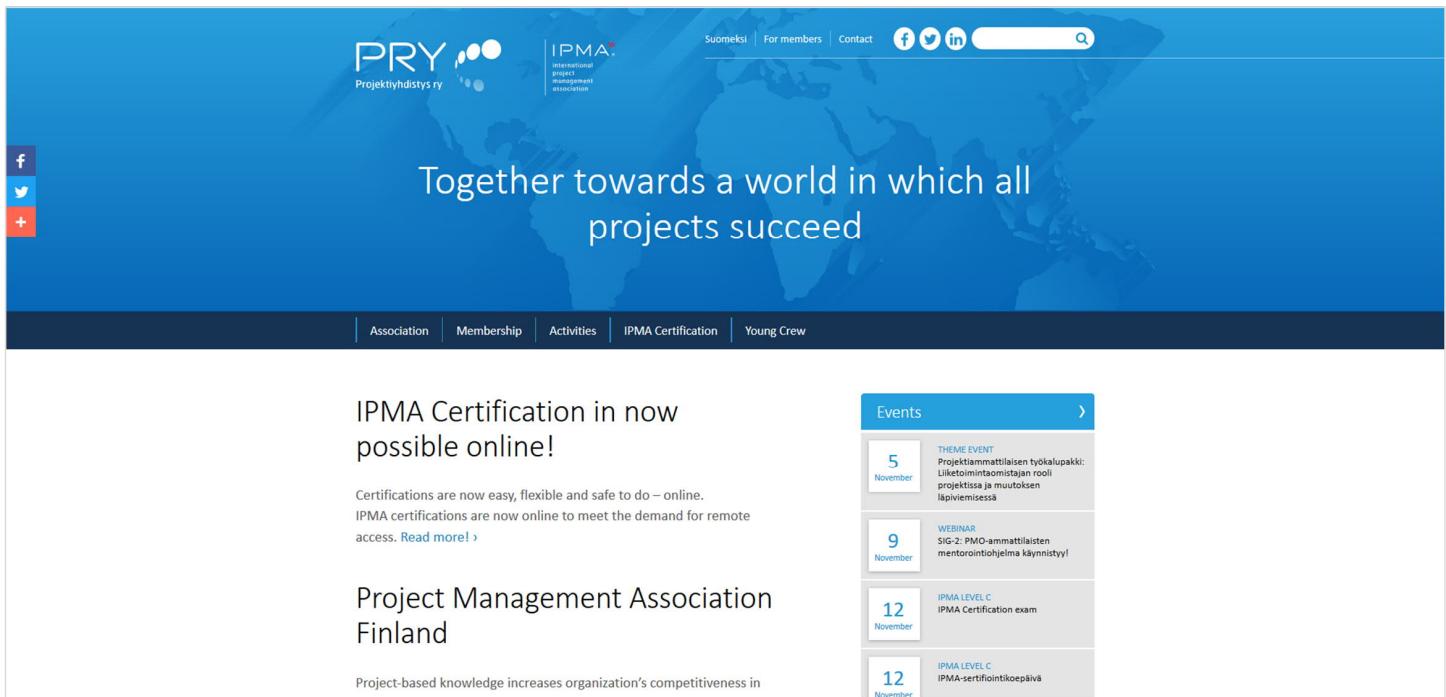
TIVIA acts as a platform for its members in the development of know-how, networking as well as advocacy. The main activities of TIVIA are events, research, trainings and advisory.

TIVIA is a member of CEPIS (The Council of European Professional Informatics Societies) and IFIP (International Federation for Information Processing).

TIVIA was founded in 1953 as an association of punched card technology users – Finnish Punched Card Society.

- [TIVIA presentation \(PDF\)](#)

<https://www.pry.fi/en>



PRY
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Project Management Association Finland

Project-based knowledge increases organization's competitiveness in

Events

Date	Type	Description
5 November	THEME EVENT	Projektiinmestarien työkalupakki: Liiketoimintomistäajan rooli projektitöissä ja muutokseen läpiviemisessä
9 November	WEBINAR	SIG-2: PMO-ammattilaisten mentorointiohjelma käynnistyy!
12 November	IPMA LEVEL C	IPMA Certification exam
12 November	IPMA LEVEL C	IPMA-sertifiointikoe päivä

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Project meetings

Project meetings

- Very often used – but also expensive – **need needs to be evaluated every time** (vs. scrum daily meeting)
- Meetings **need to be effective**
 - Good **preparing** & agreed playing **rules**
 - All relevant meetings are **described and name given**
 - And **memo** created.
- Project can have e.g.
 - Customer meetings
 - Steering meetings
 - Project team meetings
 - Working group meetings
 - Subcontractor/supplier meetings
 - Review meetings
 - Daily stand-up meetings
 - Demo meetings
 - Planning meetings, etc.

Are your meetings useful knowledge sharing, or nice chit-chat with coffee and bun (= waste of time) ?



Project group's weekly meeting

- It is strongly recommended that groups try to find a fixed **weekly** meeting time (and place).
- If you don't have many matters/issues to discuss, it is still worth having a short meeting "around the same table" ("F-2-F") weekly, nowadays virtual meeting. Something may pop up and come to mind during the meeting (out from agenda).
- There are many reports from project groups which tried to agree a meeting time one week at a time (difficult). Also many groups realised that virtual meetings are less productive than face-to-face meetings (well, you already knew that...).

But covid-19 may restrict good plans.

Meetings have five essentials (M5E)

1. An **agenda** is sent to participants beforehand, at least on the day before
2. Somebody acts as a meeting **chair**
3. Somebody writes a meeting **memo** (filename ?, stored at ?)
4. That memo is stored somewhere **available** (so errors and misunderstandings may be found quickly)
5. There is some way (who and by what media) to **inform** those who could not participate the meeting.

It may well happen that you need to check something from a memo days or weeks later. As well as from communication channel text flow (some log and search would be useful).

General project meetings tips

- Find out at the beginning of a meeting, if anybody is having any time limits this time (e.g. has to leave after 30 min)
- Smart groups are making their meeting agenda such a way, that first will be discussed
 - matters that interest the whole group
 - matters that are most important
 - matters that must be reacted quickly.
- Groups may agree turns for bringing some bun or candy etc. to the meeting. In virtual meetings, figure out something. ; -)
- Groups may agree some kind of "penalty" (e.g. coffee and bun, or one euro to the pot) for being late from the meeting starting time. ; -)

"Whistle blowing", (ethics were at L02)

Whistle blowing is good for all

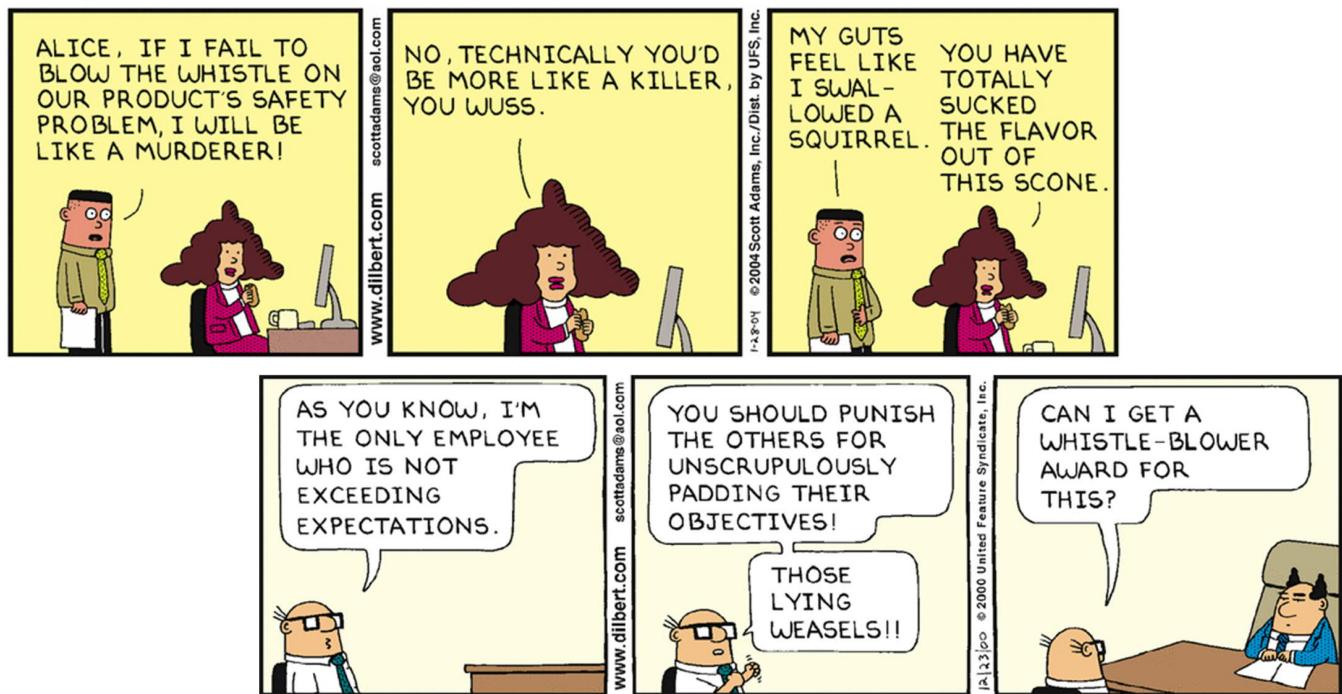
Whistle blowing means informing (all relevant stakeholders) about a possible big/fatal/major problem, which may happen soon, or is already actual.

If you find out some major bug, or a big flaw in project/process...

- in short term, you may think "hide it", or "do not get involved"
- in long term such causes harm to your company, customer, and yourself.

E.g. if you deliver software to customer, and you know there are some bugs... customer will find those out sooner or later, and will be very angry then. So it is better to inform customer and negotiate how to handle those. Customer usually understands honest developers/vendors.

In Finland and especially at Pirkanmaa software business has quite small population, so "bad news" will spread out rapidly. **A company who is known about "cheating" customers do not easily get any more projects.** And if you have messed up personally (not accidentally), it may be difficult to get a new ICT job. This may also be legal responsibility.



U4 ANTI-CORRUPTION RESOURCE CENTRE TRANSPARENCY INTERNATIONAL the global coalition against corruption

U4 Helpdesk Answer

Overview of whistleblowing software

Enter product name, software category, service name, ... Write Review Software Services For Sellers My List Join or Sign In

Home / Whistleblowing Software / Free Whistleblowing Software

Overview Free

Top Free Whistleblowing Software

Check out our list of free Whistleblowing Software. Products featured on this list are the ones that offer a free trial version. As with most free versions, there are limitations, typically time or features.

If you'd like to see more products and to evaluate additional feature options, compare all [Whistleblowing Software](#) to ensure you get the right product.

[View all Whistleblowing Software](#)

Results: 4

Top 4 Free Whistleblowing Software in 2020

- ▶ Got Ethics
- ▶ Ethicontrol
- ▶ BKMS Incident Reporting
- ▶ Canary Whistleblowing System

From group to teamwork

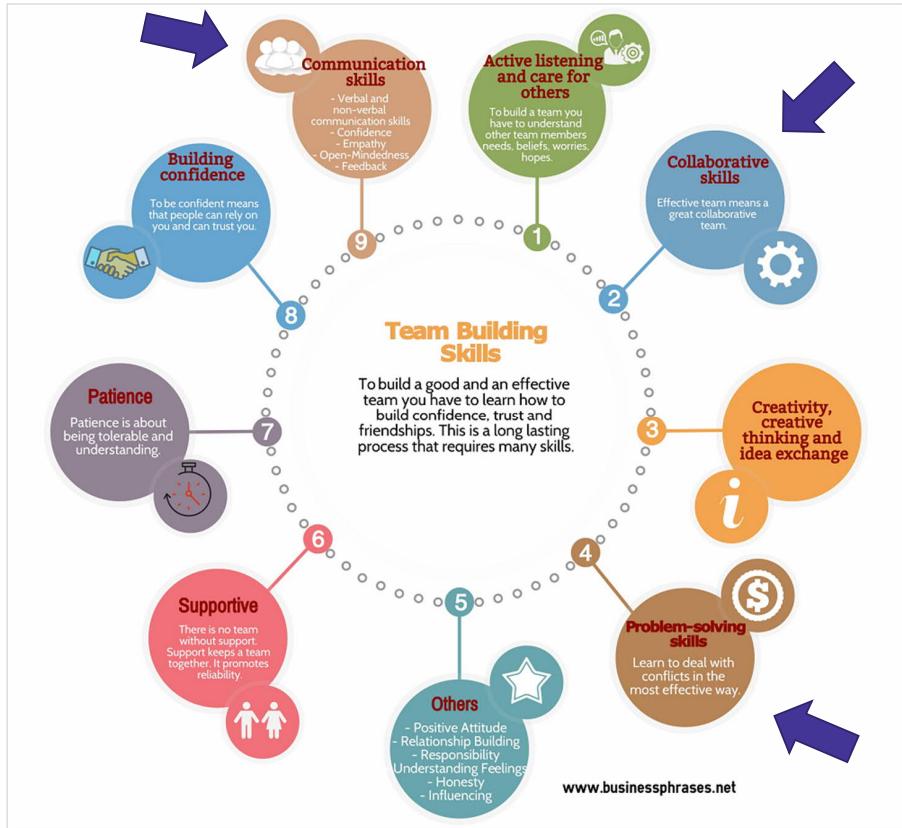
Development of project team

- Forming
 - Team members are quite dependent on leaders
 - Acting is careful and formal
 - Looking my place in the team
- Storming
 - Members are against leader or given mission/tasks
 - Testing leader and other team members
 - Conflicts and internal fights
- Norming
 - Starting to approve other's roles
 - Teamspirit starts to develop
 - Clearness of playing rules
- Performing
 - Productive, efficient and creative team
 - Working towards common targets
 - Clear commitment to given tasks.

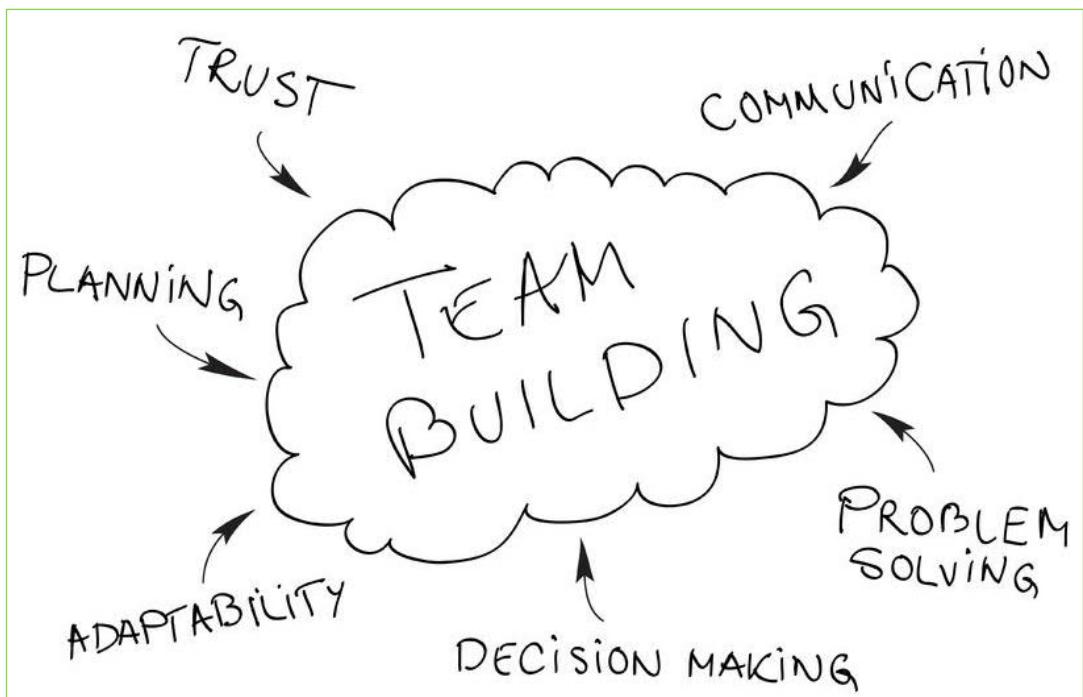


Adapted from Tuckman 1965

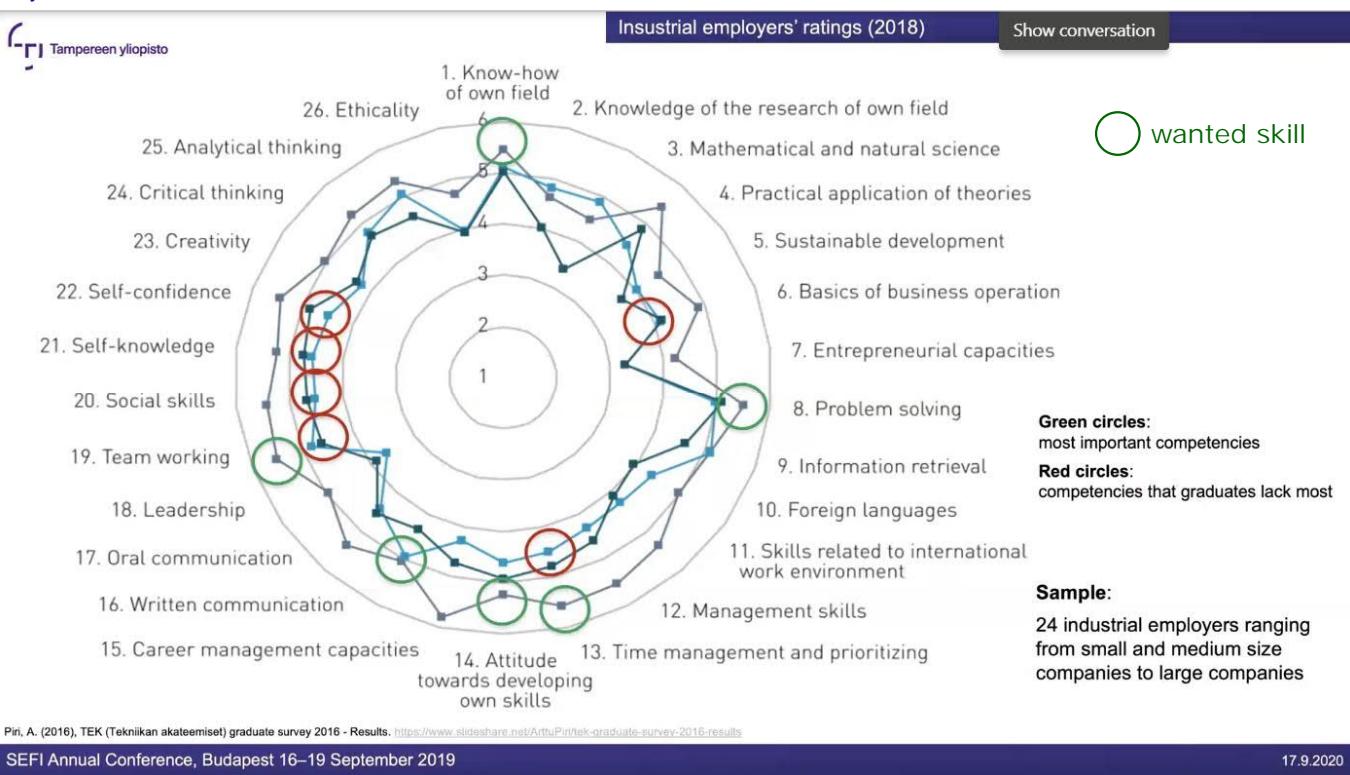
Team building skills



Team Spirit (cohesion) would be good for project working.

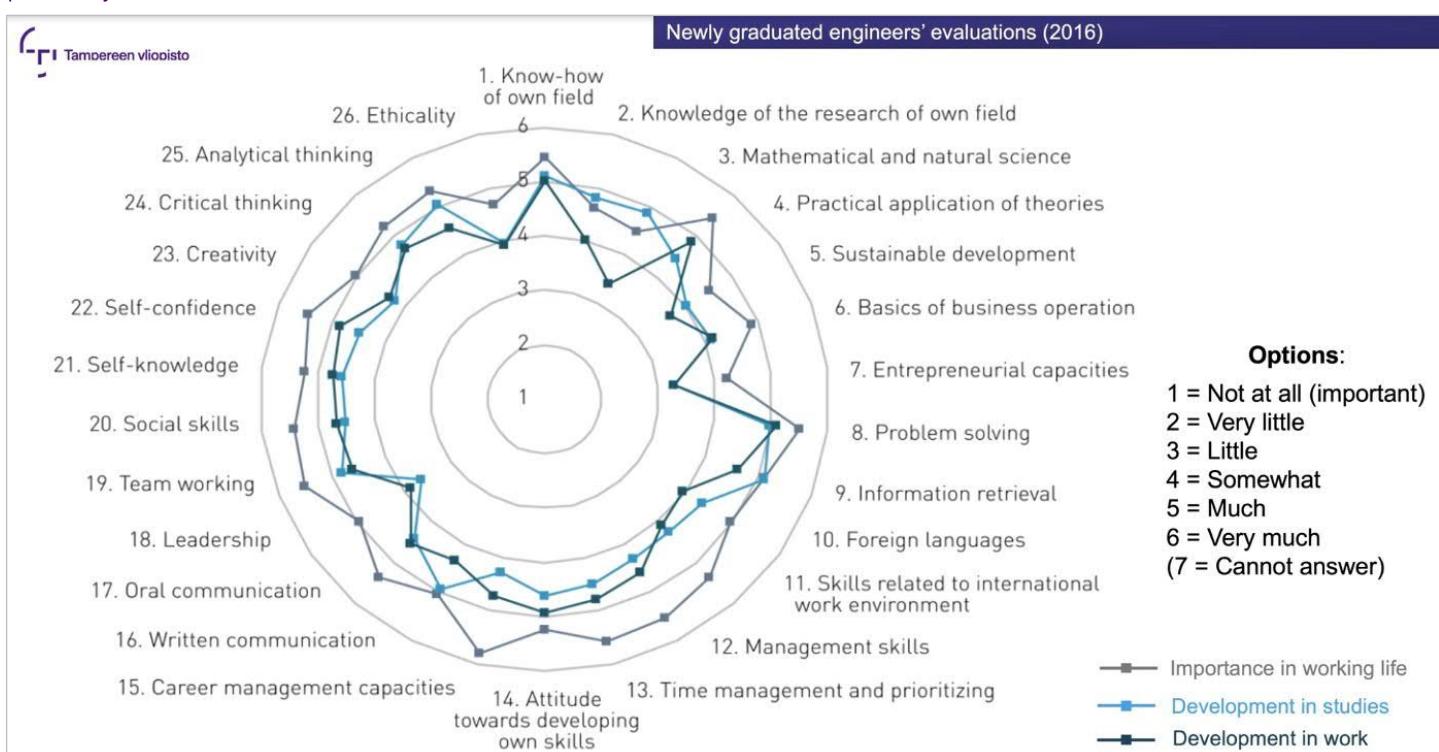


Companies: "graduated had biggest flaws in their behaviour..."



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Top 7 Qualities of a Successful Team

- 1) They **communicate** well with each other. (opinions, ideas)
- 2) They **focus** on goals and results. (clear plan)
- 3) Everyone **contributes** their fair share. (commitment)
- 4) They offer each other **support**. (happy to assist)
- 5) Team members are **diverse**. (unique skills and roles)
- 6) Good **leadership**. (glue, motivation, trust, respect)
- 7) They're **organized**. (wide skill set)
- 8) They have **fun**. (it shouldn't be all work and no play!)

[<https://theundercoverrecruiter.com/qualities-successful-work-team/>]

I. “TOGETHER EVERYONE ACHIEVES MORE”

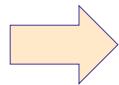
-----Author Unknown

What Makes a Great Team?

- 1. Knowledge**
- 2. Cooperation**
- 3. Flexibility**
- 4. Common Goals**
- 5. Dedication**
- 6. Planning**
- 7. Effort by All**

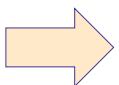
In a good Team, everybody knows...

- Who we are...
- What is our goal...the same goal !
- How to communicate with others....
- Who is making decisions.....on what !
- Who is available and when...
- Who is responsible...and about what !
- What is our plan...to achieve goals !
- What are my tasks... and what others have !
- What kind of competencies I have...and others have !
- What role (s)he has in the team !

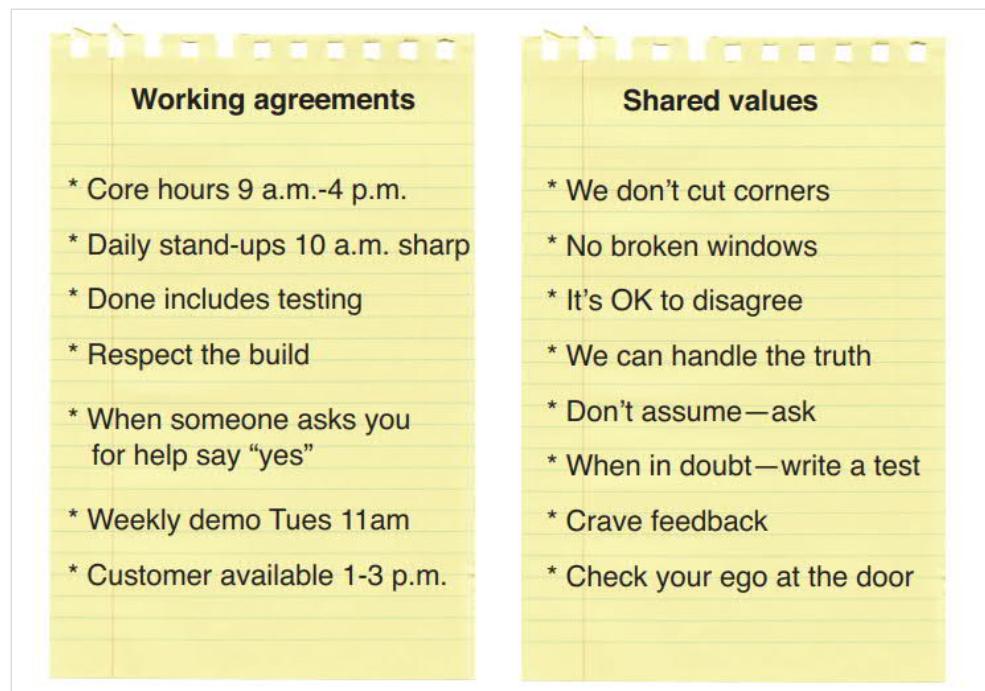
 Trust !

Everybody should have...

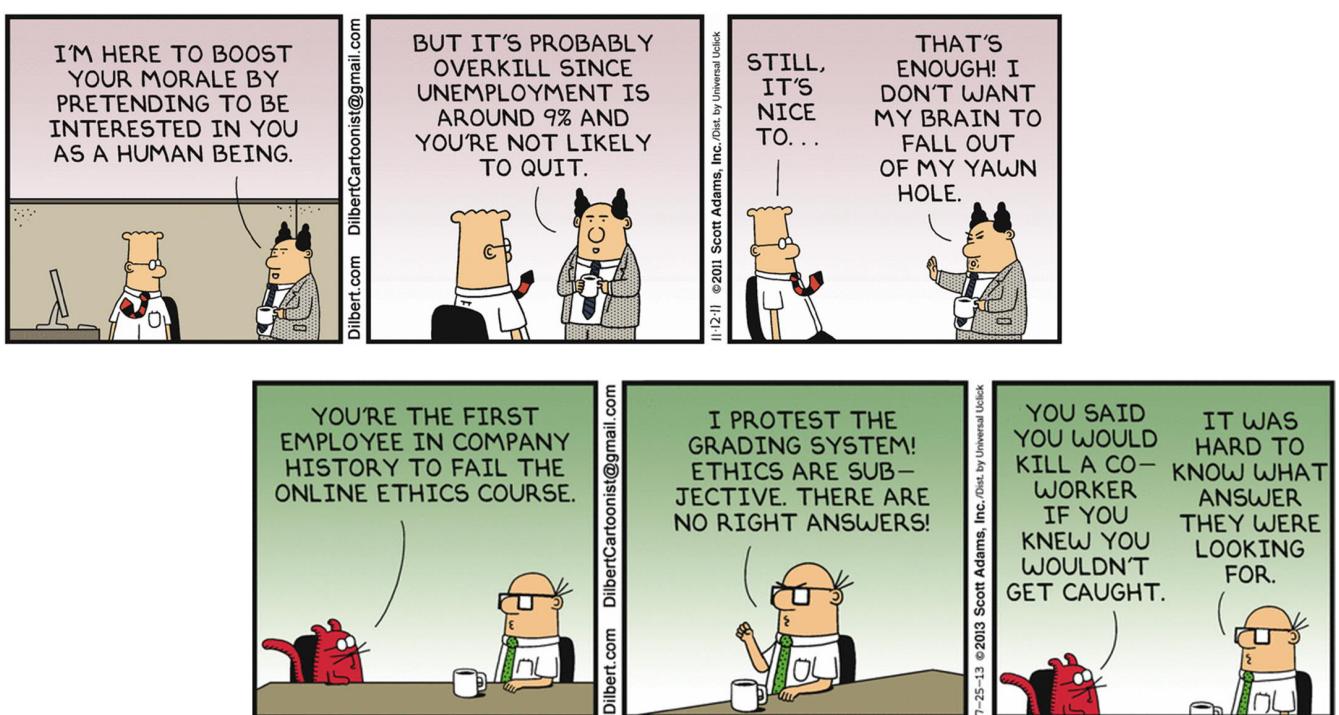
- Trust to him/herself...and others !
- Skills to be a member of my team !
- Tools for successful communication !
- Knowledge about the SW process...and our implementation of it !
- Knowledge about tools we are using !
- Support from others...when needed !
- Innovative attitude to content creation !
- Motivation to work for our project !

 Successful Team !

Some agile team principles



[Agile samurai, 2010]



5 dysfunctions of a team

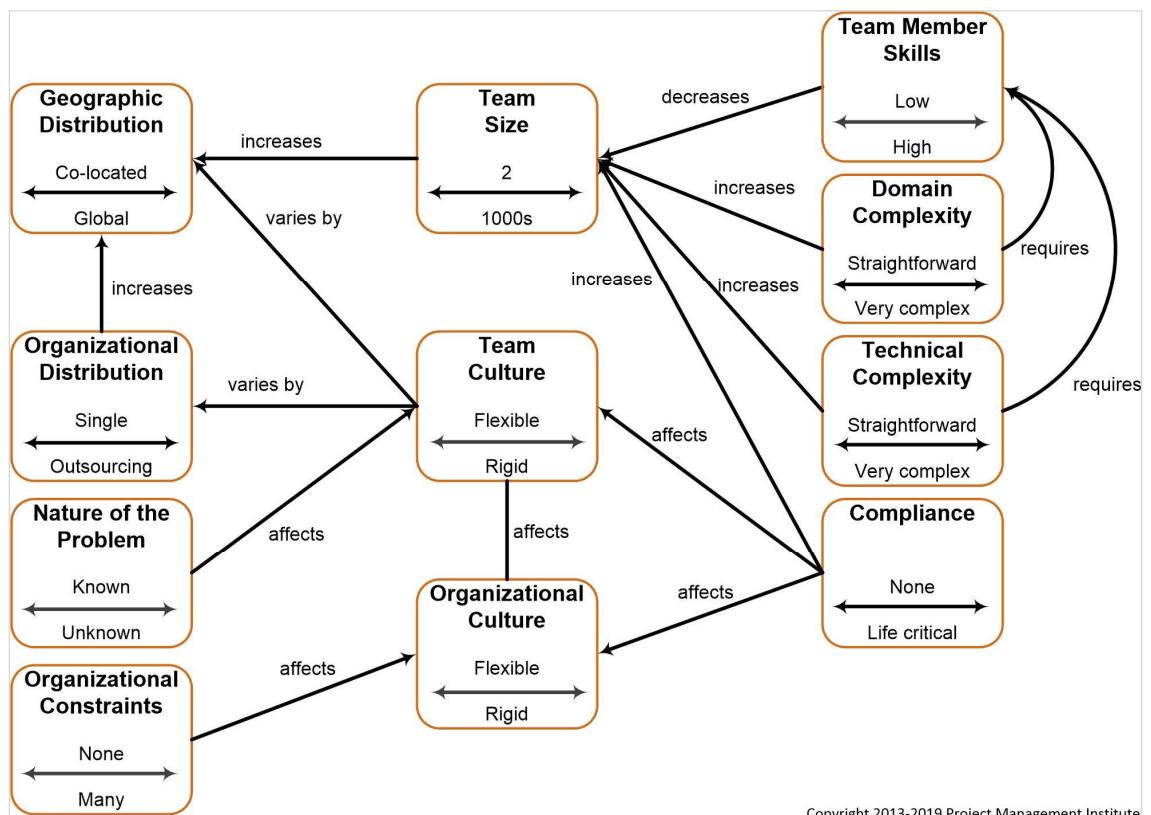


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Relationships between context factors



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Think sports teams...

Master level skilled individuals may not make a perfect team. They may be "strong persons" and thus do not easily will share their skills with others, they do not understand the TEAMWORK with other top players.

On the other hand, medium-level players may succeed to beat such a "top" team by good teamwork. And there is no "mental pressure to be the best".

Just work as well as you can, and then find out was it enough.

So: in a good team, the total sum is more than individuals' summed performance.

Ice-hockey world championship games 2019; Finland won (3rd time).

Teamwork

Successful attributes needed for effective teamwork

- Commitment to team success and **shared goals**
- Interdependence (team is more than just sum of members)
- Interpersonal Skills (e.g. **discuss openly**, be honest and supportive)
- Open Communication and positive feedback
- Appropriate team composition (everybody knows his/her role)
- **Commitment** to team processes, leadership & accountability.

[Pina Tarricone: Successful teamwork: A case study, 2002]



"We like to bring together people from radically different fields and wait for the friction to produce heat, light and magic. Sometimes it takes a while."

BTW, is your project assignment group a TEAM ?

Common Goal: The members work to achieve a particular team objective.

Team spirit: The enthusiasm of the members to reach out the team goal is always high.

Trust: In a team, individuals believe and rely on each other's capabilities and skills.

Leadership: There is a clear leadership within a team, and the selected team leader heads the activities.

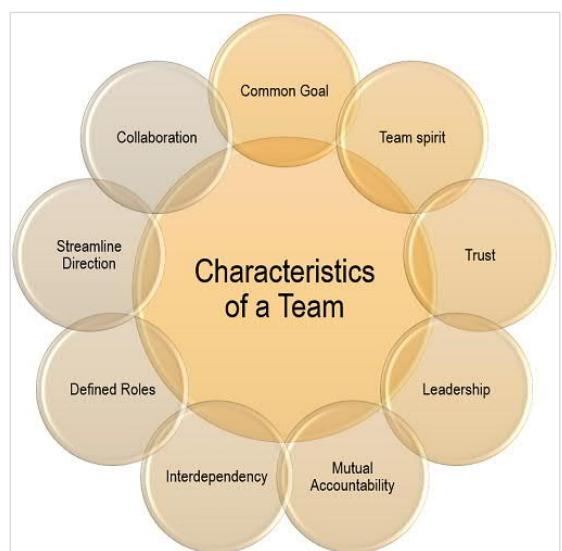
Mutual Accountability: Each individual is equally responsible for the underperformance and failure of the team.

Interdependency: The actions of the members within a team are jointly dependent on that of other members.

Defined Roles: Every individual in a team, has been allocated specific roles or responsibilities to accomplish.

Streamline Direction: The team leader is the one who shows the way to the members and monitors their operations.

Collaboration: There is a high degree of synergy or coordination among the team members.



[<https://theinvestorsbook.com/group-vs-team.html>]

Groups Versus Teams

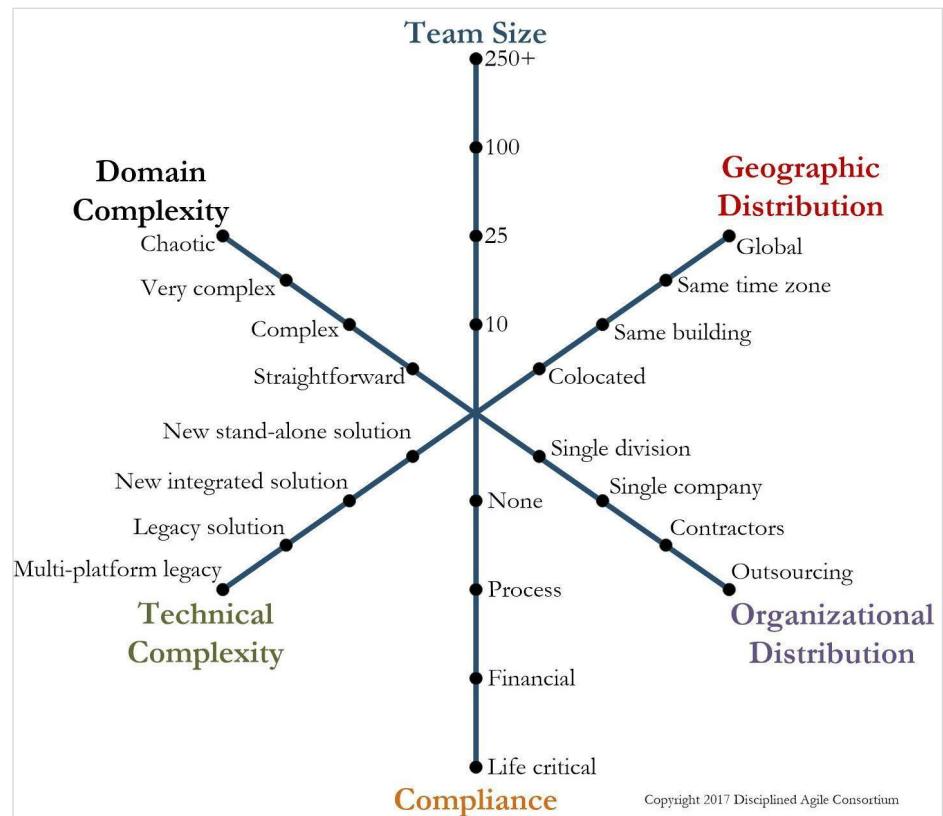
Work Teams

- Leadership role is shared
- Accountable to self and team
- Team creates specific purpose
- Work is done collectively
- Meetings characterized by open-ended discussion and collaborative problem-solving
- Performance is measured directly by evaluating collective work output
- Work is decided upon and done together
- Can be quickly assembled, deployed, refocused, and disbanded

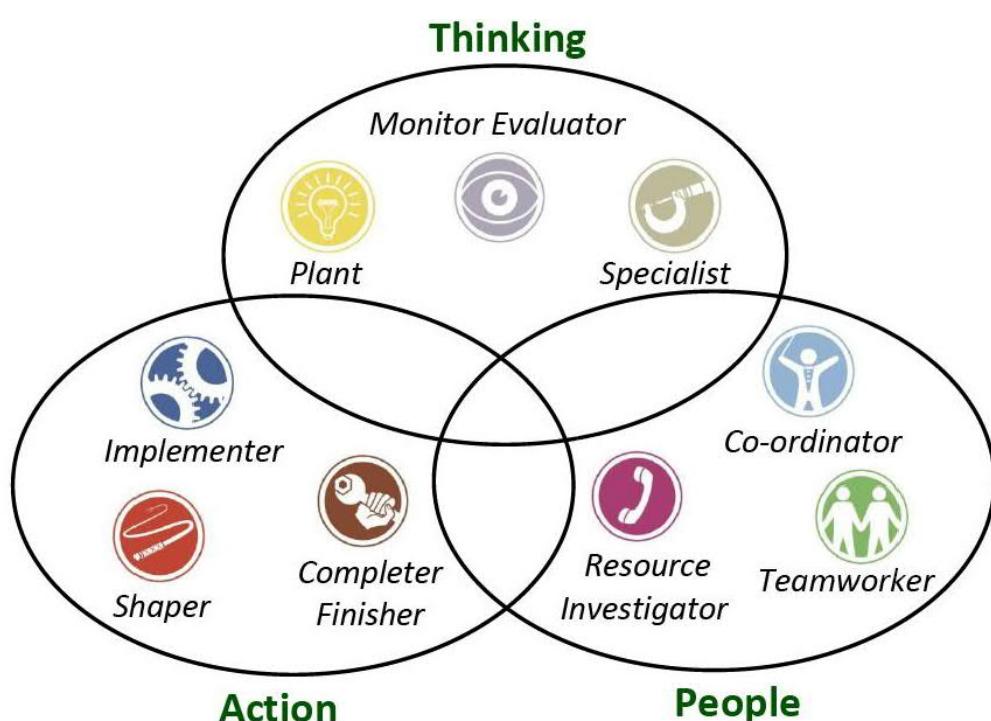
Work Groups

- One leader clearly in charge
- Accountable only to self
- Purpose is same as broader organizational purpose
- Work is done individually
- Meetings characterized by efficiency; no collaboration or open-ended discussion
- Performance is measured indirectly according to its influence on others
- Work is decided upon by group leader and delegated to individual group members

Tactical scaling factors faced by teams



Team roles...



Remember: perhaps not everybody wants to be on the 5th level, like you.

the PASSION PYRAMID™



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As you have already noticed during your studies, individual performance varies during weekdays and hours.
Some company people has said that difference is even ten times (10x).

Remember also worker's ethics.
Ask and get help.

04.11.2020

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Some company people have said that 10x (ten times) productivity differences between workers can happen.

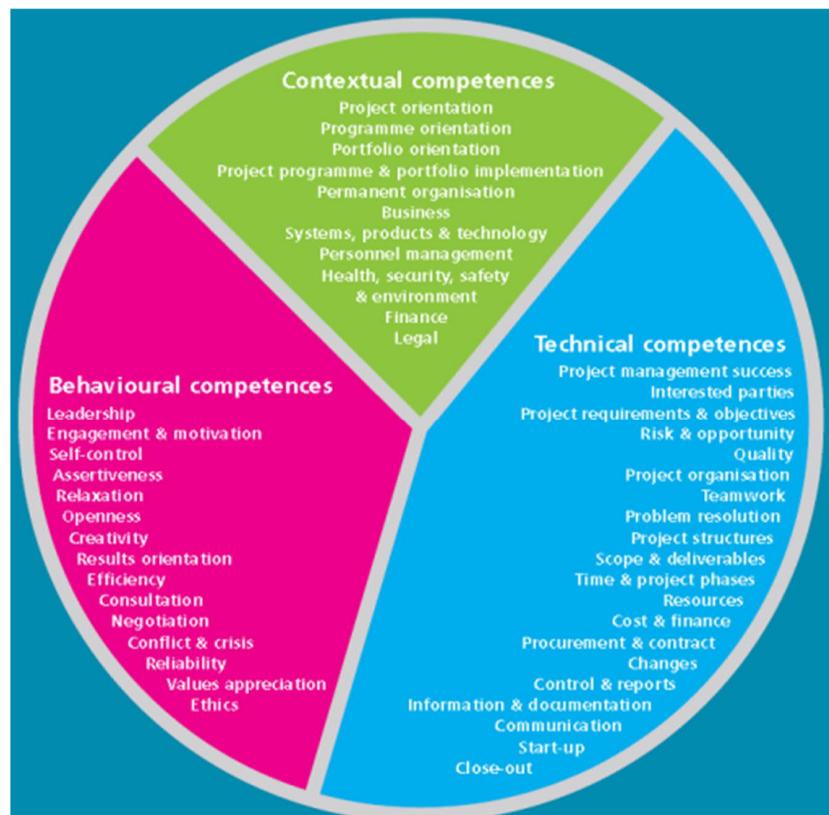
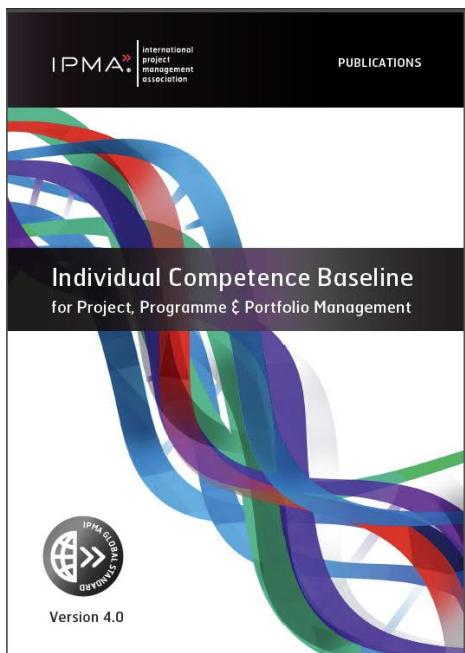
But perhaps not all the time ?

Think your own efficiency; is it on same level at any weekday or time ??

CloudPleasers by Forrest Brazeal



Ten times zero is still zero.
Some shops that say they hire only '10x developers' have never solved for x.



COMP.SE.100-EN (ItSE) Introduction to Software Engineering

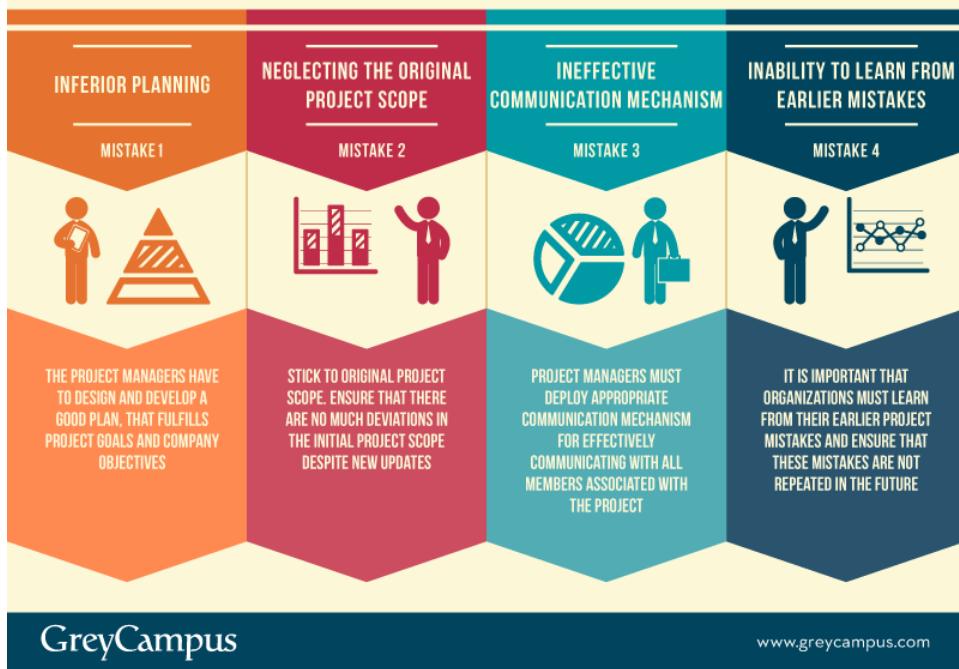
Lecture 9, 04.11.2020

Tensu: remember to pause
Zoom lecture recording

Zoom lecture break, 10 minutes stretching, walking, etc.

Common problems

4 MISTAKES THAT DETER PROJECT SUCCESS



4 !

Folklore: "if you do not know the history, you must face it again and again".

Common problems at student projects

Picked from OHJ-PROJ/TIE-PROJ final reports

- tools (or **skills** for using those...)
- other hurries (**work**, other courses, hobbies,...)
- technical problems (environment, hw, sw,...)
- goals **not understood** right or agreed well
- **misunderstandings** and communication errors
- documentation errors and too abstract text
- not accurate enough workload guesses
- sickness, **illness**
- **unfamiliarity** of projects and/or application area
- incompatible www browsers
- poor **meeting** process handling (mostly waste of time).

Causes of conflicts in work groups [Borg et al., 2011]

- **ambition differences** (will to do the best, or just do what is required)
- **cultural differences** (you just have to know or realise those)
- bad communication (there is no mind-reading)
- **strong wills** (personal differences)
- unclear goals (who does and what)
- **different prior knowledge** (studies)
- aversion towards methods/tools ("I don't want to use Git").

Possible solutions to conflicts [Borg et al., 2011]

- state group rules early & clearly
- encourage to discuss problems
- well-defined roles
- start work with small tasks.

Agree communication channels and habits.

Project Plan may be considered a "group contract".



Classical case story: Finnish taxation system 1992.

one famous project failure...

- the features and size could not be estimated beforehand
- the product grew much bigger than what was planned
- changes were made continuously (a really agile project ?? but too much is too much)
- not much coordination between parties/stakeholders
- really big hurry towards the end of the project
- close to the end project manager got ill, rather unexperienced man replaced him
- many features were brand new, never tried before ("state-of-the-art")
- at system testing it was noticed that the product was unstable, but the project was already late and the customer was pressing, so it was published anyway
- afterwards it was found that such a product could not have worked in any way ("impossible mission").

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The Wasa
ship case

Sweden
1628

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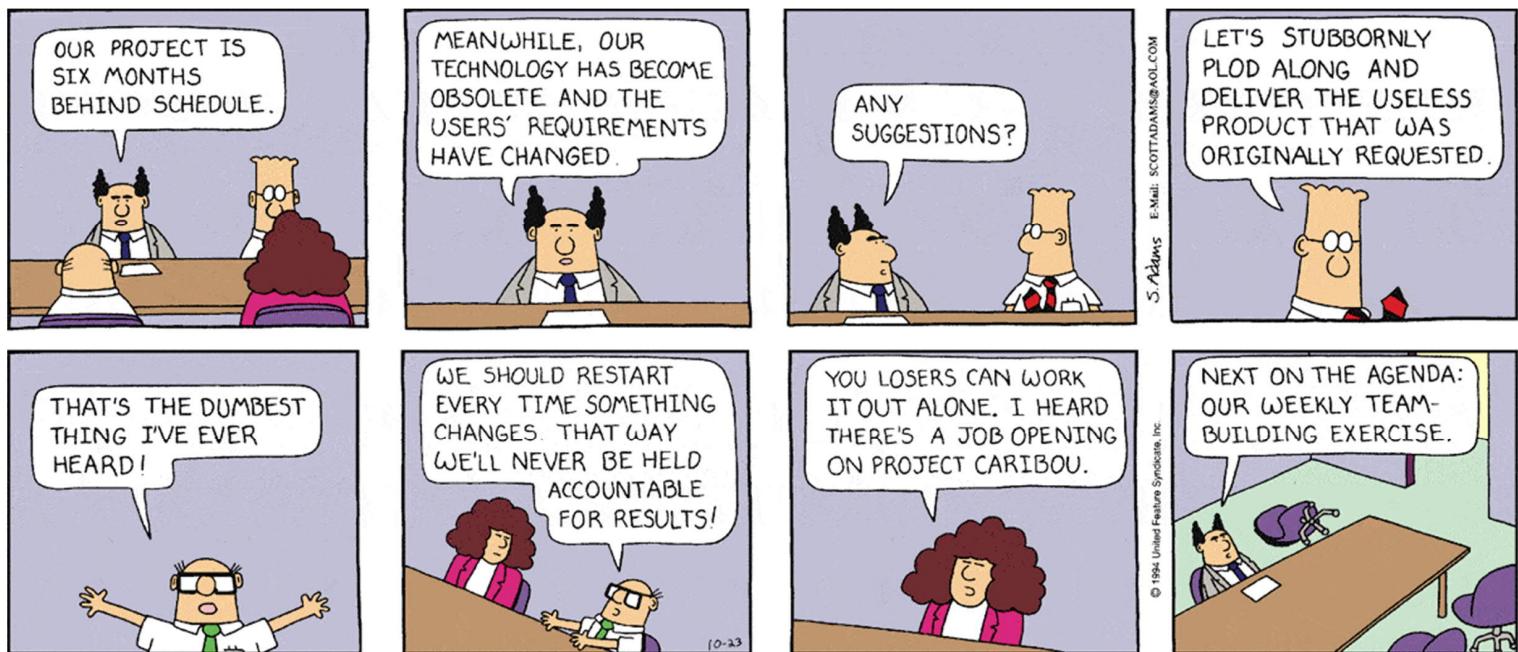
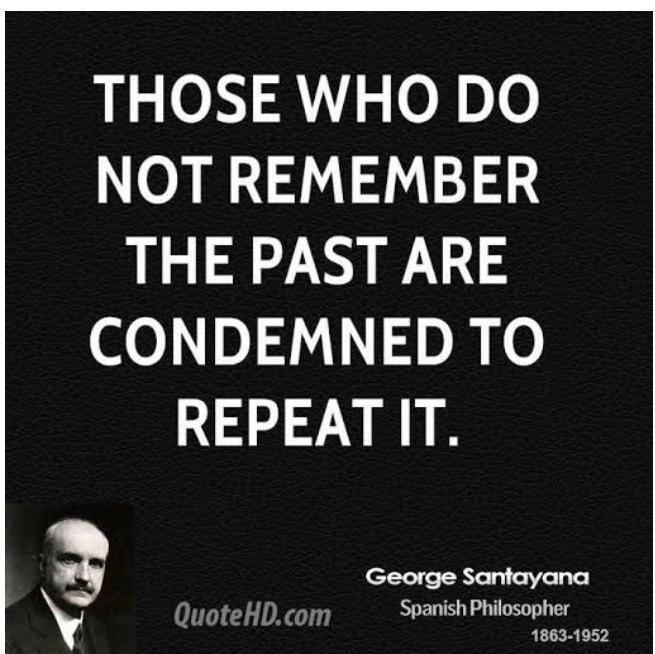
10 common problems project teams face

[<https://www.apm.org.uk/blog/10-common-problems-project-teams-face/>]

1. Lack of trust (know each other)
2. Conflict and tension (different opinions are OK, but handling...)
3. Not sharing information (shared knowledge is power)
4. Low engagement (interested, committed, willing)
5. Lack of transparency (leaders will be followed)
6. No long-term thinking (see the big picture, even when in hurry)
7. Badly perceived, not delivering (brand, image, reputation)
8. Poor change management (change is constant, change curve)
9. Working in silos (work together, three musketeers)
10. Not going in the same direction (vision, purpose).

Value previous experiences;
project final reports ("lessons learnt"),
or software project "war stories".

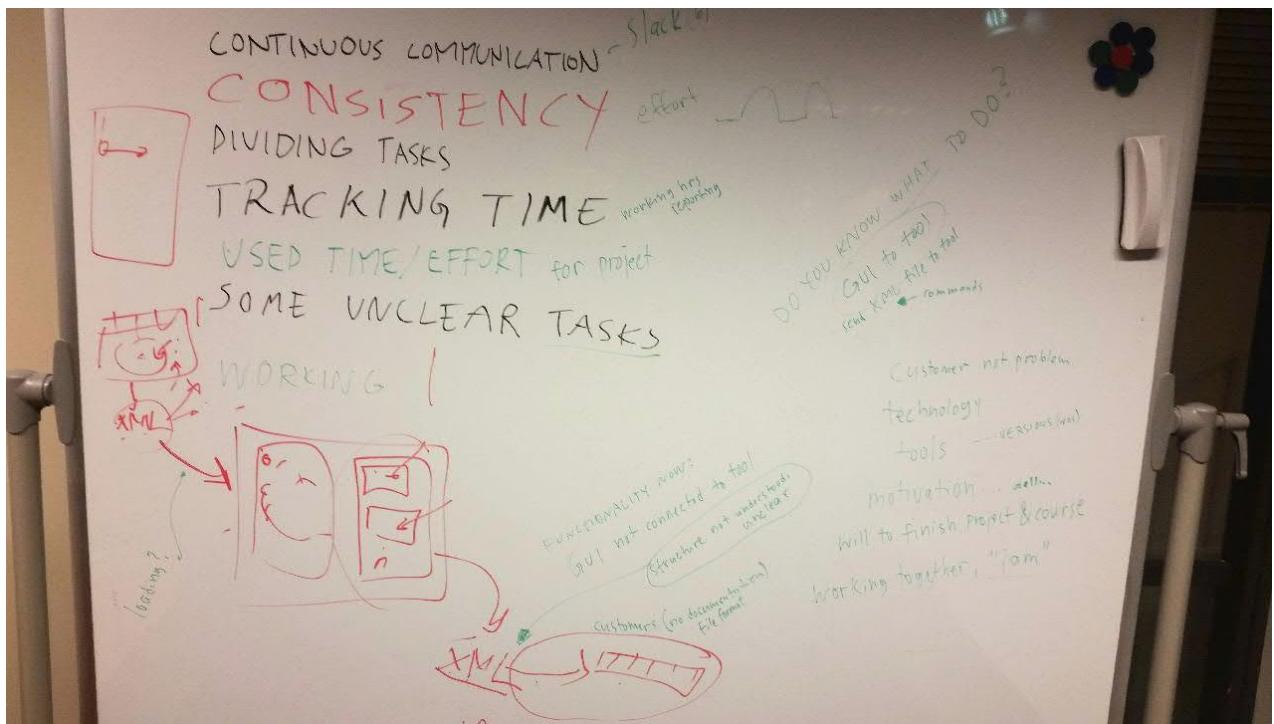
(FI: omista virheistään oppii hyvin, mutta fiksumpaa olisi oppia toisten virheistä.)



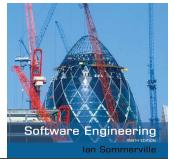
Sometimes, if project is stuck, it may be the best solution if the whole project would be cancelled/terminated.

"Project work goes well as long as less than half of the groupmembers are thinking about suicide."

One project's crisis meeting... 45 min to weed out root problem



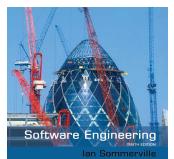
Soft skills



Managing people

- ✧ **People are an organisation's most important assets.**
- ✧ The tasks of a manager are essentially people-oriented. Unless there is some understanding of people, management will be unsuccessful.
- ✧ **Poor people management is an important contributor to project failure.**

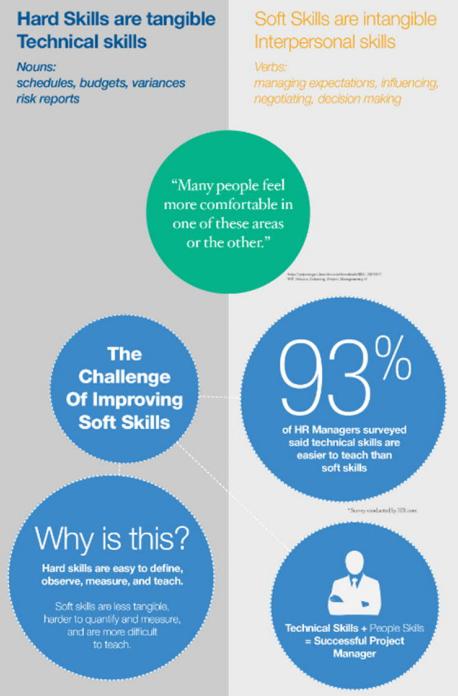
Consider: many people are lucky to be able to work with something they like, but some just have to work with it to earn their living.
How is it with you ?



People management factors

- ✧ **Consistency**
 - Team members should all be treated in a comparable way without favourites or discrimination.
- ✧ **Respect**
 - Different team members have different skills and these differences should be respected.
- ✧ **Inclusion**
 - Involve all team members and make sure that people's views are considered.
- ✧ **Honesty**
 - You should always be honest about what is going well and what is going badly in a project.

HARD SKILLS + SOFT SKILLS = PROJECT SUCCESS



HARD SKILLS VS SOFT SKILLS

HARD SKILLS

Specific and quantifiable knowledge or abilities; usually absolutely necessary for success

Can be demonstrated through tangible evidence such as a degree, certificate or examples of work

- Computer Skills
- Foreign Languages
- Math Skills
- Programming Skills

SOFT SKILLS

Unquantifiable attributes that cannot be proven but must be demonstrated through work style and approach

Successful demonstration of soft skills is left to subjective opinion

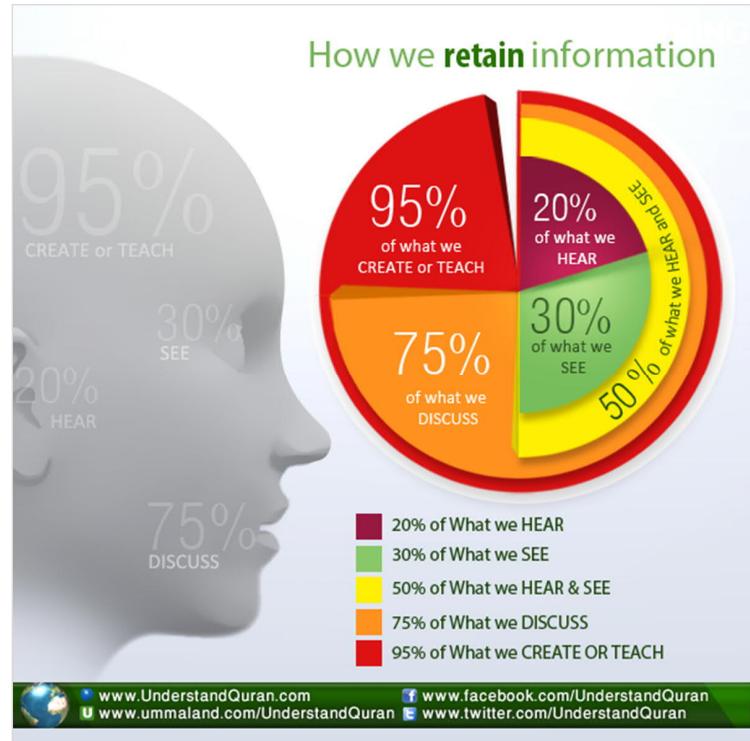
- Communication
- Leadership
- Team Work
- Creativity



As you already know, personal productivity changes daily and hourly.

Remember also ethics (see lecture L02).

That means:
be active,
be curious.



[<https://understandquran.com/know-learn-know-can-learn-best/>]

Some project thoughts...

"A man got to know his limitations"

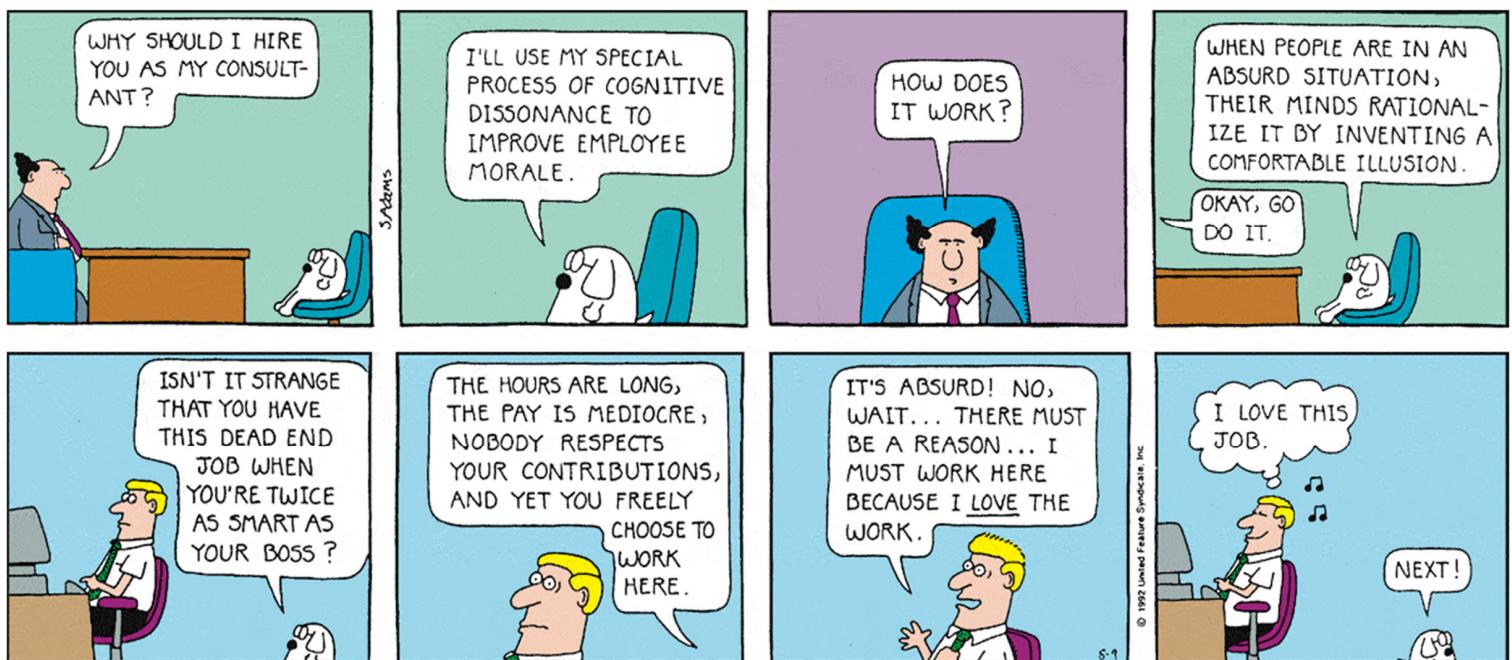
[Dirty Harry movie character]

"The project goes well as long as less than half of the groupmembers are thinking about suicide."

[modified from expedition team handbook]

Motivation

Motivation is essential.. in work and in studies



Motivation is essential for work

No (wo)man can work many weeks or months on a project without any breaks.

The Gurus ("big boys") say that on every project there are 2-3 motivational dips/holes/pits/gaps (FI: motivaatiokuoppa).

Those low-motivation moments may appear... when or on what occasions ??

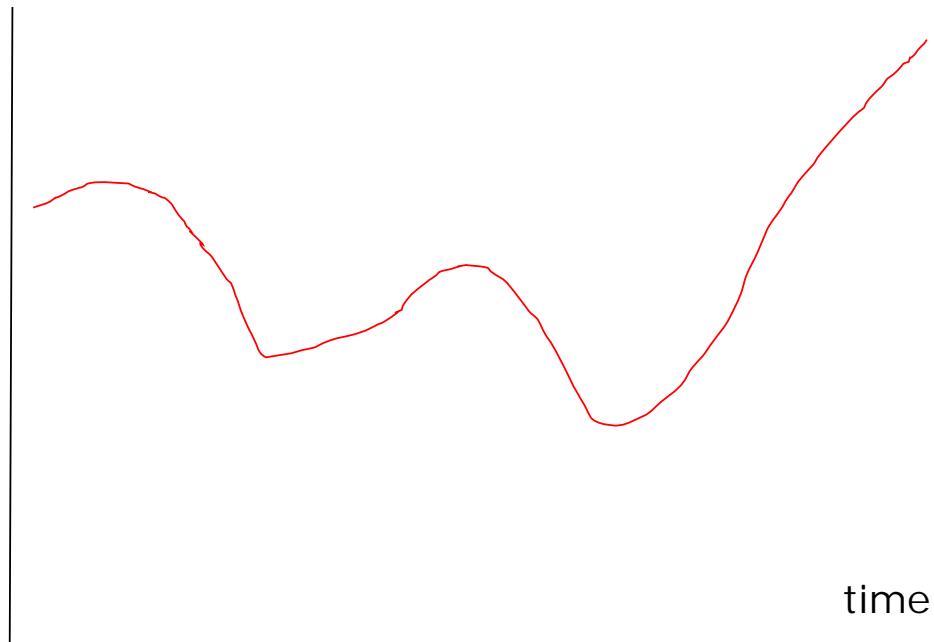
(hint: project management is NOT rocket science, so you know the answer).

Motivation is essential...

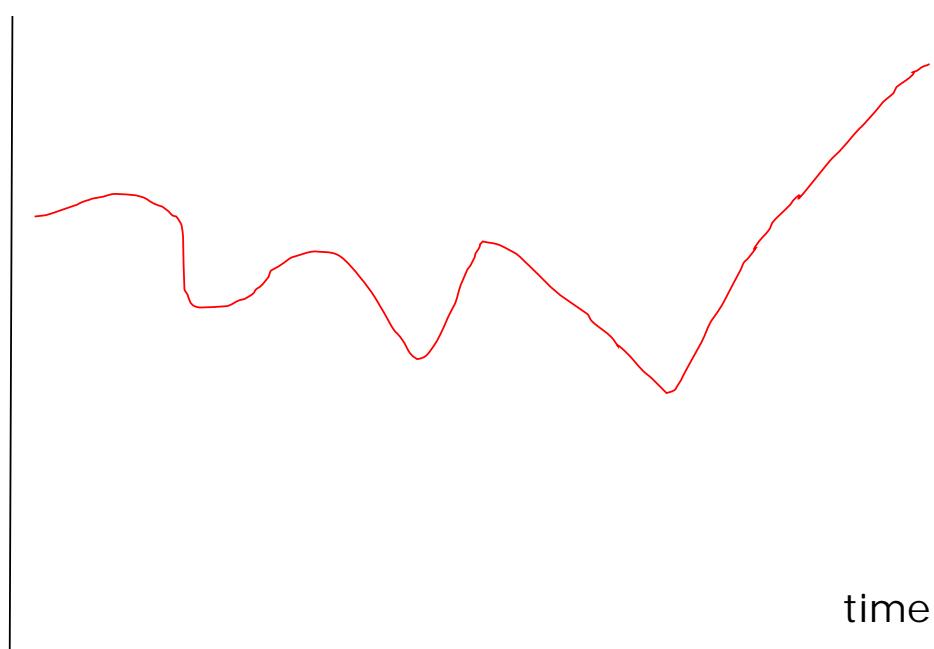
motivational dips/holes/pits/gaps may appear

- after a holiday or some other break
- after hard intensive work (project fatigue)
- when project work is not advancing, perhaps because of a difficult sw/hw problem
- when groupmembers are busy with other matters (studies, personal, or work)
- because of customer actions (busy, not sure what wants, not responding)
- because of personal "civilian life" problems.

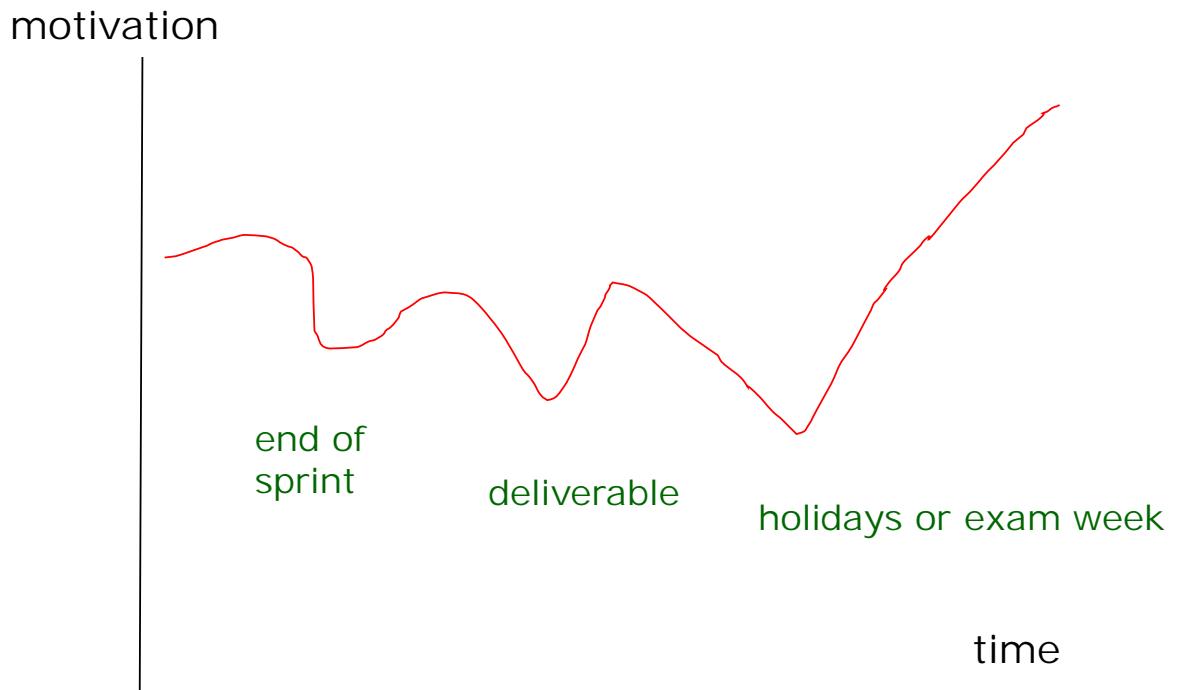
motivation



motivation



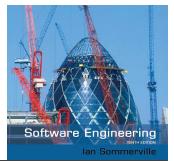
Some examples of motivational lowpoints...



Better motivation inside a project group

- project's state is **discussed** openly in weekly meetings
- if you are temporarily very busy with other matters (= not available for this project), **inform** others EARLY (before deadline)
- proceed with the project work with **small steps**, to make at least some visible progress
- have some good time (**party**) after some success or major deadline (e.g. after Sprint end or deliverable)
- sometimes take some **free** time (a few days, or weekend) from the project (even the whole group)
- **too much or too little work may lower motivation** (everybody knows what to do this, and next, week)
- but: also "dull" work has to be done in projects
- remember: other students have survived the course in previous years (so you can, too).

Motivation balance



- ✧ Individual motivations are made up of elements of each class.
- ✧ The balance can change depending on personal circumstances and external events.
- ✧ **However, people are not just motivated by personal factors but also by being part of a group and culture.**
- ✧ People go to work because they are motivated by the people that they work with.

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TEAMwork is communication and interaction, sum is more than just individuals together.

The way people treat you is a statement about who they are as a human being.

It's not a statement about you.

QUOTEDIARY.COM

“

I've learned that people will forget **WHAT YOU SAID,**
people will forget **WHAT YOU DID,**
but people will never forget how you **MADE THEM FEEL.**

”

MAYA ANGELOU

POPSUGAR.

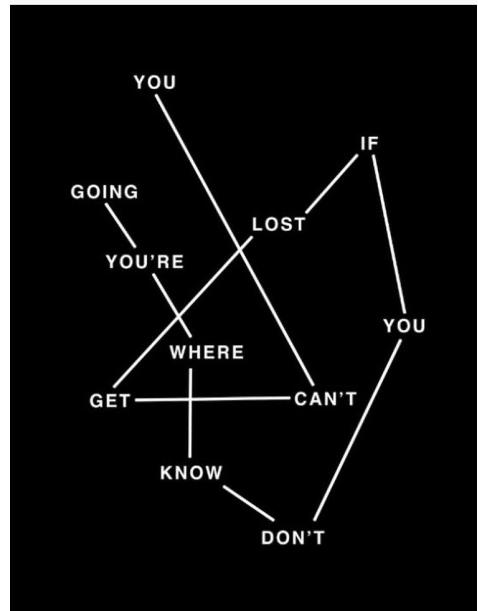
Tools

Tools in project work

Tools (other than IDE etc.) in software projects help you know and understand "situational status".

The definition is not exact, but usually

- situational awareness (FI: **tilannekuva**) = you know past (history) and present, and you have measurements available.
- situational understanding (knowledge) (FI: **tilanneymärrys**) = you understand what you still have to do, to reach project goals.



[<https://www.redbubble.com/i/greeting-card/>]

Project tools

In project working, only very basic tools are actually needed (so that you know what to do, when to do, how project progresses, who is the boss and who are your teammates = where to find help)

- **task list** (e.g. Kanban board, Product Backlog, Sprint Backlog)
- **calendar** (all deadlines, travelling, meetings, etc. marked well in advance)
- **communication channels** (use as agreed; e.g. proper subject/topic).

PERT = Project (or Program) Evaluation and Review Technique
CPM = Critical Path Method.

But you still have to estimate work size, tools just visualise your decisions.

One example of a project calendar

		presentation		deadline		exam week		2015			
		ws or visit lecture		meeting or inspection							
SYYSKUU		LOKAKUU		MARRASKUU		JOULKUU		TAMMIKUU		HELMIKUU	
1 M Pirkka	36 ●	1 K Rauno Rainer Raina	●	1 L Pyhänpäivä	49	1 M Oskari	1 S Uuden vuodenp.	1 T Uuden vuodenp.	1 S 3. sunn. ennen paastonalkaajia Riitta	1 M Jemina Lumia Aamu	6
27 T Sini Sini Justus	●	2 T Jukka Salli Solla	●	2 S Tuomas Topias	●	2 M Anelma Unelma	2 M Apeli	2 M Elmo Elmer	2 M Hugo Valo	2 M Rona Armi	●
3 K Salli Solla	●	3 P Raimo	●	3 M Terho	45	3 K Meri Vellamo	3 M Antti Juhani	3 M Tuomas Juhani	3 T Tuomas Teija	3 T Riku Rikhard	●
4 T Ansia	●	4 L Saja Saja Frans	●	4 T Reima	●	4 T Aira	4 S Tuomas Juhani	4 S Tuomas Juhani	4 S Tuomas Juhani	4 S Tuomas Juhani	●
5 P Yrittäjän päivä	●	5 S Mikkeliinpäivä	●	5 T Herita	●	5 P Selma	5 T Tuomas Juhani	5 T Tuomas Juhani	5 T Tuomas Juhani	5 T Tuomas Juhani	●
Roni Mainio	●	Inkeri Inka	●	6 M Pinja Minttu	41	6 L Tuomas Juhani	6 L Tuomas Juhani	●			
6 L Antti	●	7 K Hirvi Pirjo	●	7 P Tuisto	●	7 K Tuomas Juhani	7 K Tuomas Juhani	●			
7 S Miro Arho	●	8 K Ilona	●	8 L Aatos	●	8 M Jean Silibulkuksen	8 M Jean Silibulkuksen	●			
8 M Taimi	37 ●	10 P Aleksis Kiven päivä suomalaisen kirjall. päivä	●	9 S Tuomas Juhani	●	9 T Kyläpäivä	9 T Kyläpäivä	9 T Kyläpäivä	9 T Kyläpäivä	9 T Kyläpäivä	●
9 T Isto Evert Vertti	●	11 L Otto Oto	●	10 S Aarre Aarto	●	10 K Jutta	10 K Jutta	10 K Jutta	10 K Jutta	10 K Jutta	●
10 K Kalevi	●	13 M Taina Tanja Taita	●	11 M Martti	46	11 T Tuomas Juhani	11 T Tuomas Juhani	●			
11 T Santeri Aleksandra	●	14 T Elsa	●	12 K Panu	●	12 P Tuuvi	12 P Tuuvi	12 P Tuuvi	12 P Tuuvi	12 P Tuuvi	●
12 P Anna Viija	●	15 T Helvi Heli	●	13 K Virpi	●	13 T Tuomas Juhani	13 T Tuomas Juhani	●			
13 L Orvo	●	16 T Seija Sirkku	●	14 P Kristian Aho	●	14 S 3. adventtisunnuntai	●	14 S 3. adventtisunnuntai	●	14 S 3. adventtisunnuntai	●
14 S Iida	●	17 P Saana Saini	●	15 L Janina Janika Janita	●	15 M Helmo	15 M Helmo	15 M Helmo	15 M Helmo	15 M Helmo	●
15 M Sirpa	38 ●	18 L Sati Säde Luukas	●	16 S Valvomisen sunnuntai	●	16 T Auli Aulikki Aada	16 T Auli Aulikki Aada	●			
16 T Hilla Hellevi	●	19 S Uljas	●	Aarne Aarno	●	17 K Jukka	17 K Jukka	17 K Jukka	17 K Jukka	17 K Jukka	●
17 K Alii Alla	●	20 T Seperi	●	18 M Eino Einar	47	18 P Aape	18 P Aape	18 P Aape	18 P Aape	18 P Aape	●
17 T Anne Tytti	●	21 P YK:n päivä	●	19 K Liisa Max	●	19 P Iiro Isakkila	19 P Iiro Isakkila	●			
19 P Reija	●	22 K Rukouspäivä	●	20 T Lapsen ollekuksien päivä	●	20 L Benjamin Kerkko	20 L Benjamin Kerkko	●			
20 L Varpu Vaula	●	23 T Rukouspäivä	●	21 P Heini Kaisla	●	21 S 4. adventtisunnuntai	21 S 4. adventtisunnuntai	●			
21 S Mervi	●	24 L Sointuri	●	22 P Heini Kaisla	●	22 M Tuomas Tommi Tommi	22 M Tuomas Tommi Tommi	●			
22 M Mauri	39 ●	25 L Kesäläkki päättyy	●	23 S Tuomiosunnuntai	●	23 T Seppi	23 T Seppi	23 T Seppi	23 T Seppi	23 T Seppi	●
23 T Syyspäiväntasaus	●	Niina Amanda Ninni	●	Ismo	●	24 T Enni Enna Eini Eine	24 T Enni Enna Eini Eine	●			
24 K Alvar Auno	●	27 M Hell Helli	●	24 M Lempi	48	25 T Joulupäivä	25 T Joulupäivä	25 T Joulupäivä	25 T Joulupäivä	25 T Joulupäivä	●
25 T Kullervo	●	28 T Simo	●	25 K Katri Kalja Katja	●	26 P Tuomas Juhani	26 P Tuomas Juhani	●			
26 P Kulismaa	●	29 T Ted Urmas	●	26 K Seija	●	27 L Hannu Hannes Hans	27 L Hannu Hannes Hans	●			
27 T Jukka	●	30 T Ella	●	27 T Ilkka	●	28 S Viatt. lasten päivä	28 S Viatt. lasten päivä	●			
28 S Aria Lenni	●	31 P Arto Arttu Arttri	●	28 P Heinä Kaisla	●	29 L Aimo	29 L Aimo	29 L Aimo	29 L Aimo	29 L Aimo	●
29 M Mikko Mika Mikaela	40 ●	29 T Rauha	●	29 S 1. adventtisunnuntai	●	30 L Rauha	30 L Rauha	30 L Rauha	30 L Rauha	30 L Rauha	●
30 T Siru Sirja Sorja	●	31 P Irja	●	Antti Antero Atte	●	31 K Sylvester Silvo	31 K Sylvester Silvo	●			

TIE-PROJ 2014-15

Just "one week at a glance" is not good... one month is better.
The whole project at a glance is much better.

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Project measuring... that depends...

Allright, WHAT you want to measure in software development ?

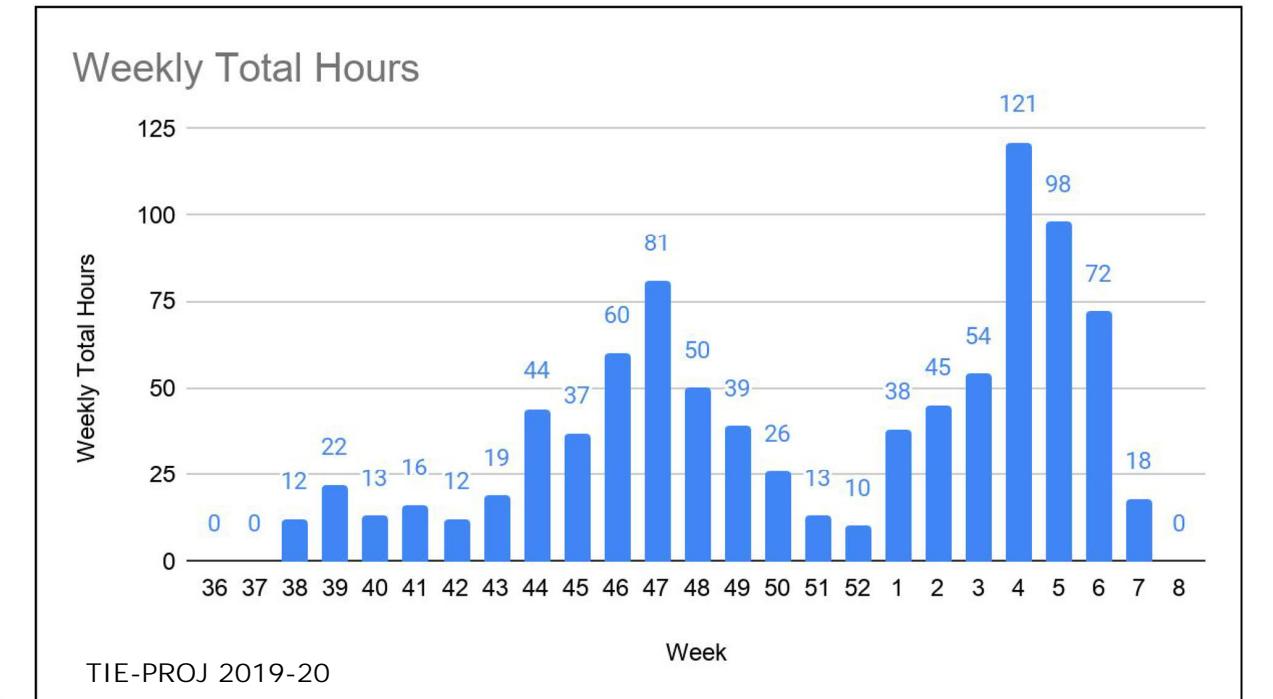
Measuring project progress is not easy, as software engineering work is much more abstract than e.g. building or machine construction.

Logging working hours is... well, better than nothing.

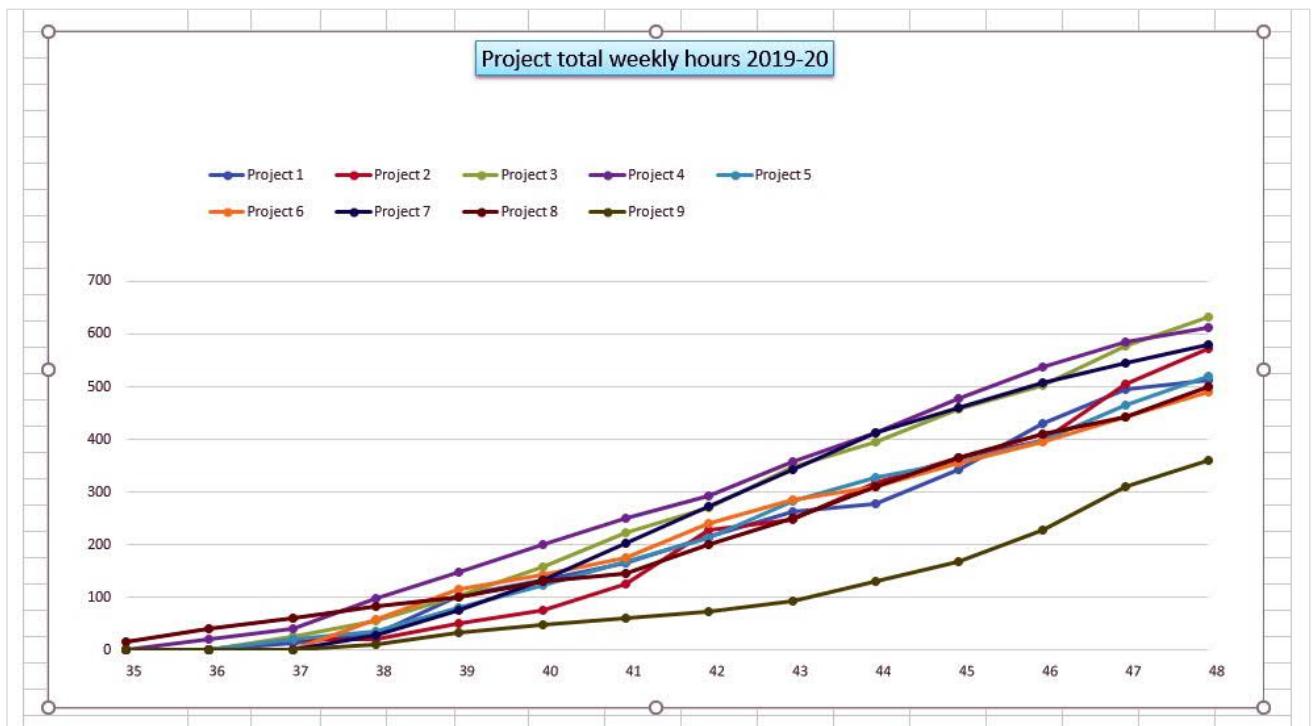
The readiness of a software project may better be calculated by number of ready and tested (= done) features/functionality. But if some small but complex feature is still not ready, the product may not be usable.

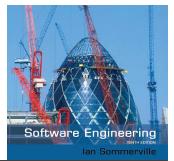
There are no percentages in software engineering (e.g. "software is 80 % ready", what does that mean... last 1/5 requires 80 % of calendar time ?).

One sw project example, from Final Report



One TIE-PROJ sw project example...





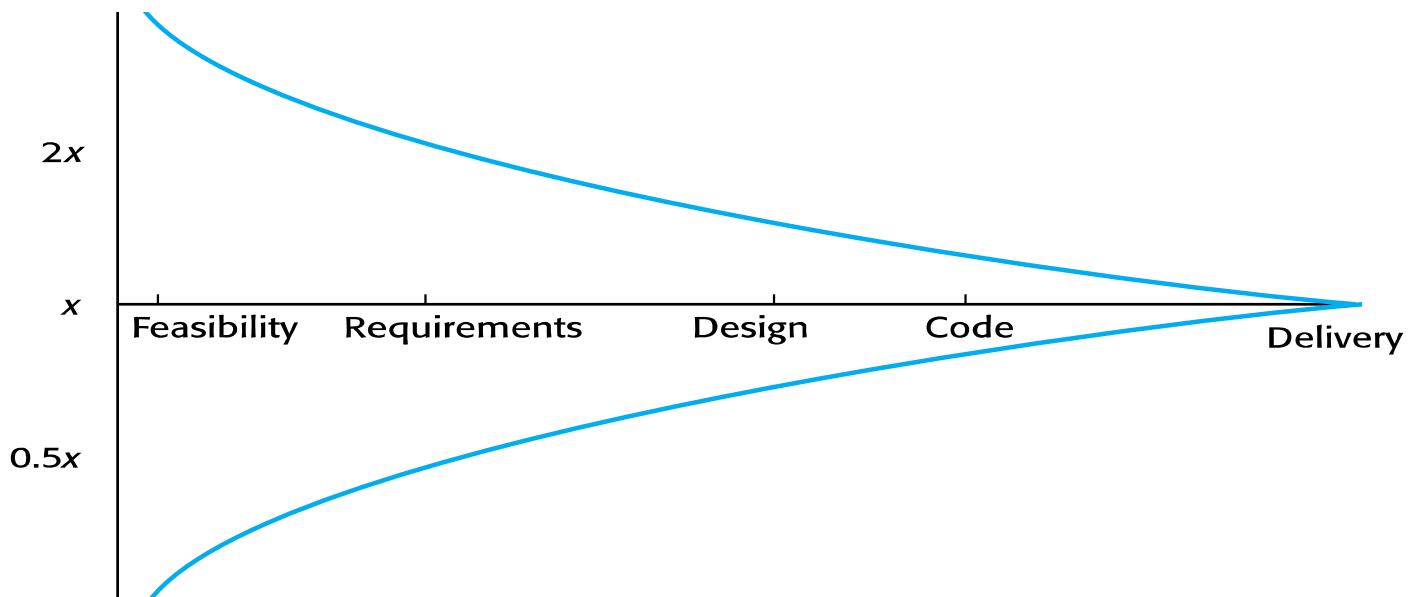
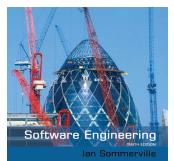
Estimation techniques

✧ Organizations need to make software effort and cost estimates. There are two types of technique that can be used to do this:

- **Experience-based techniques** The estimate of future effort requirements is based on the manager's experience of past projects and the application domain. Essentially, the manager makes an informed judgment of what the effort requirements are likely to be.
- **Algorithmic cost modeling** In this approach, a formulaic approach is used to compute the project effort based on estimates of product attributes, such as size, and process characteristics, such as experience of staff involved.



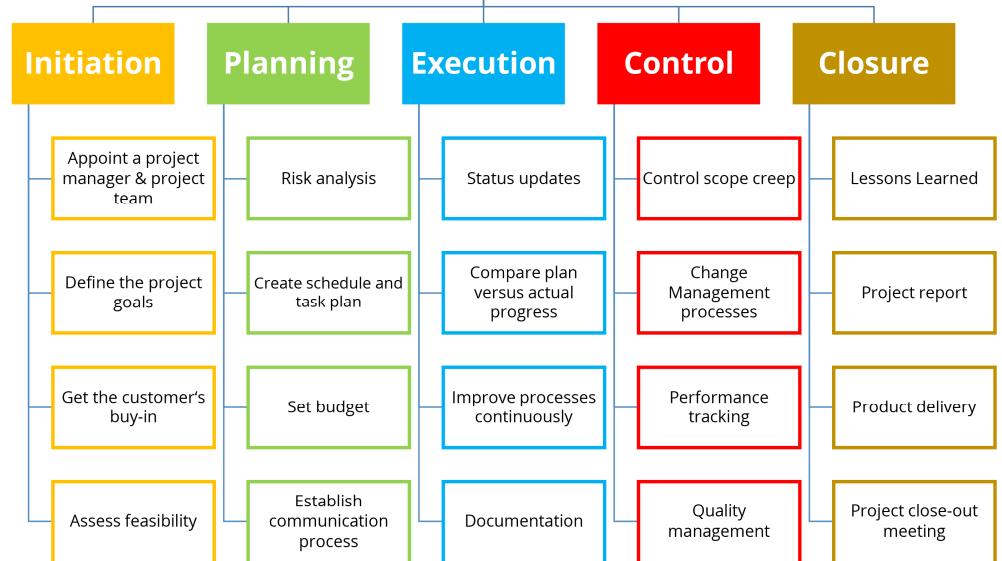
Estimate uncertainty



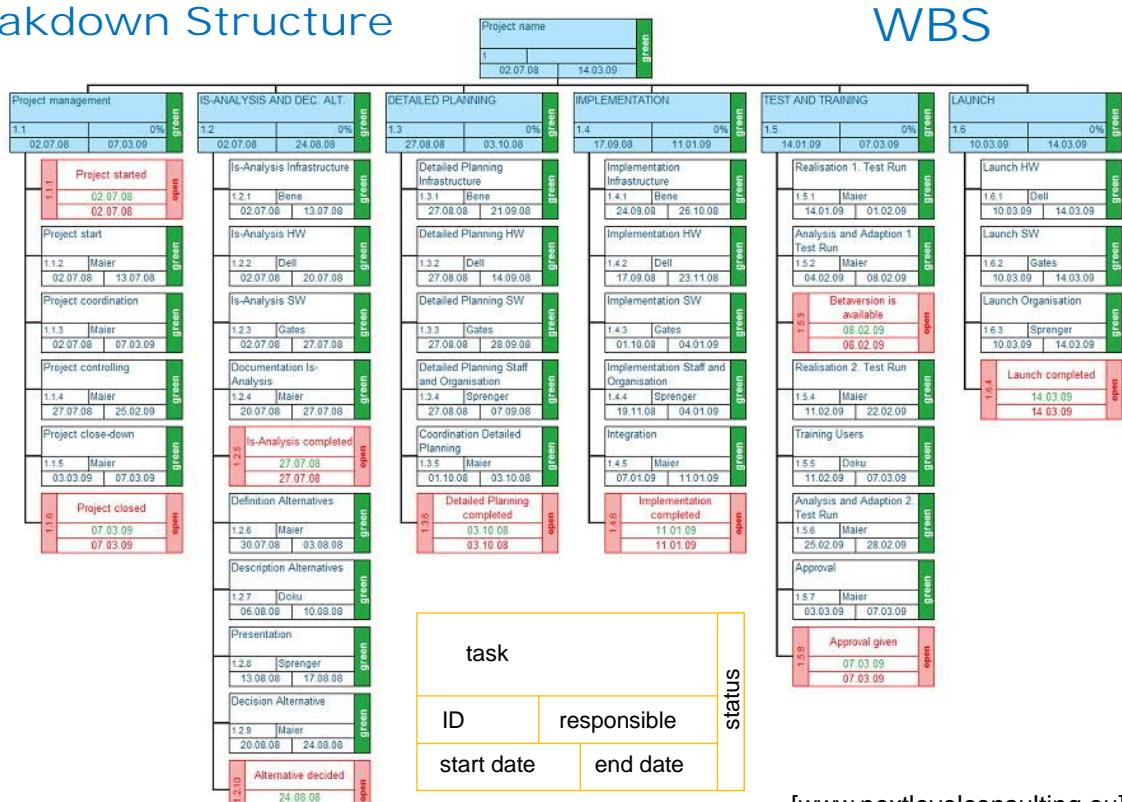
Project

WBS (work breakdown structure)

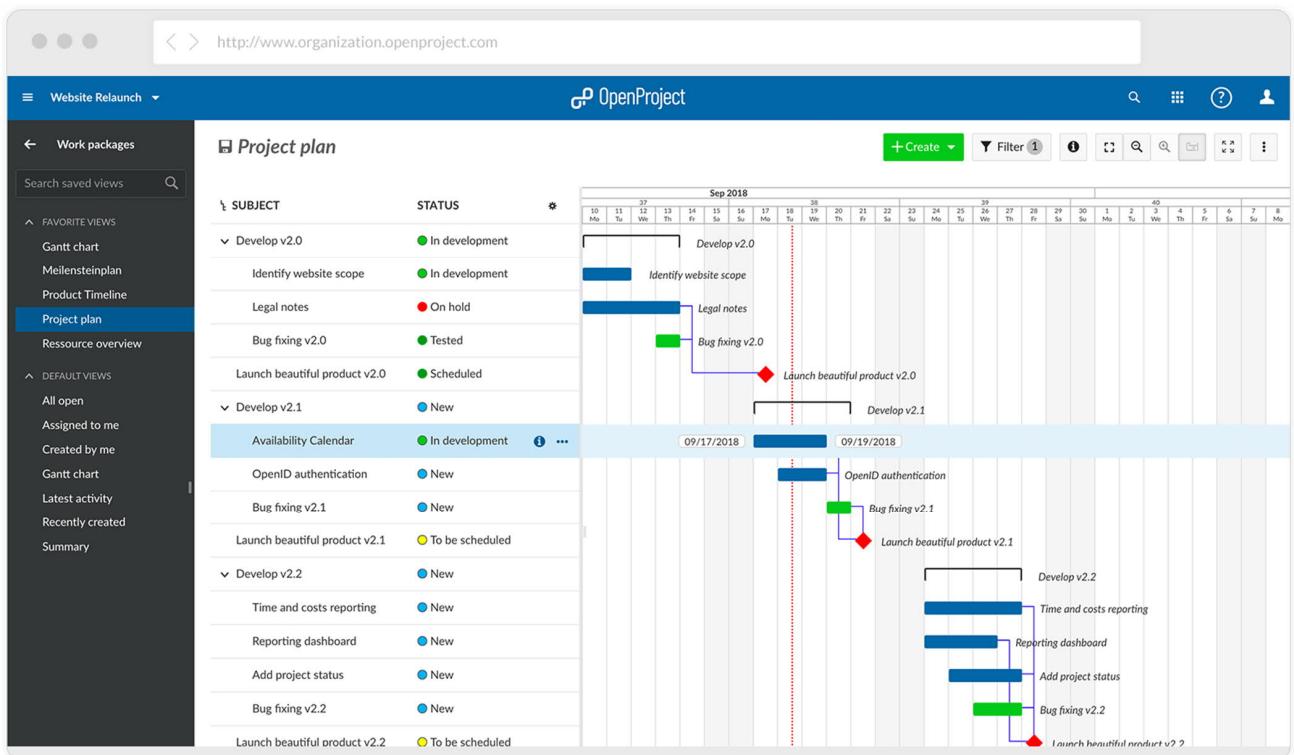
(FI: työn ositus)



Work Breakdown Structure



Timeline (Gantt chart); tasks in calendar



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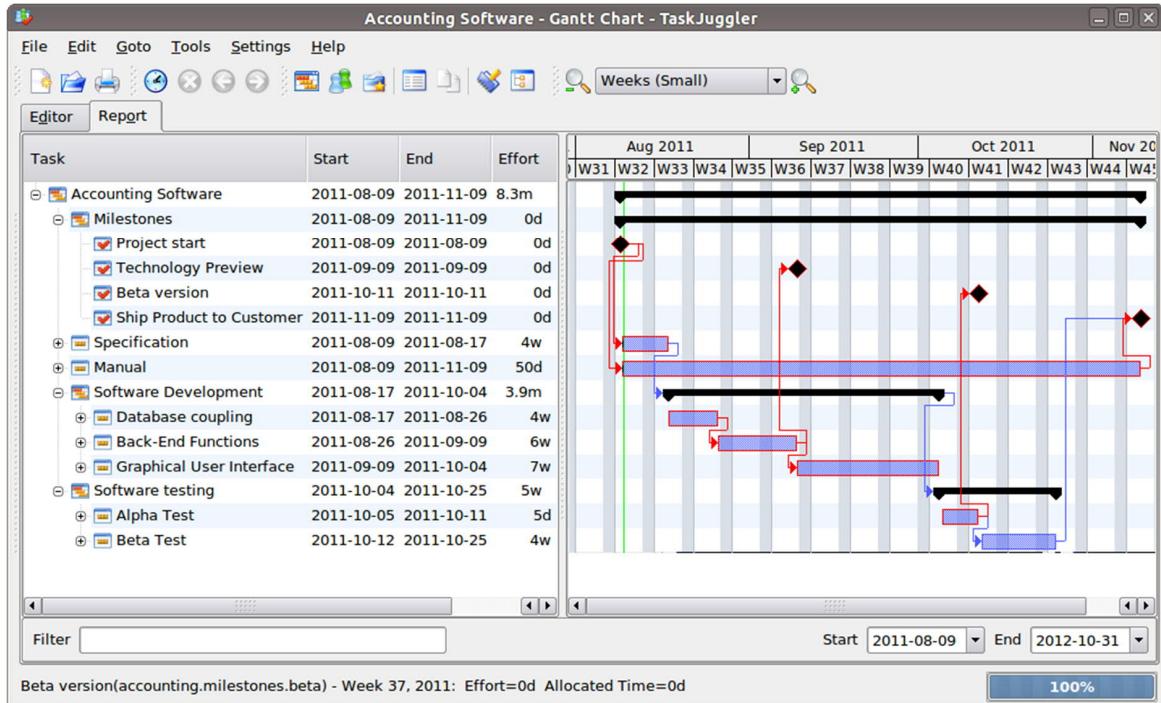
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Gantt diagram, 3



[www.conceptdraw.com]

Gantt diagram, 4

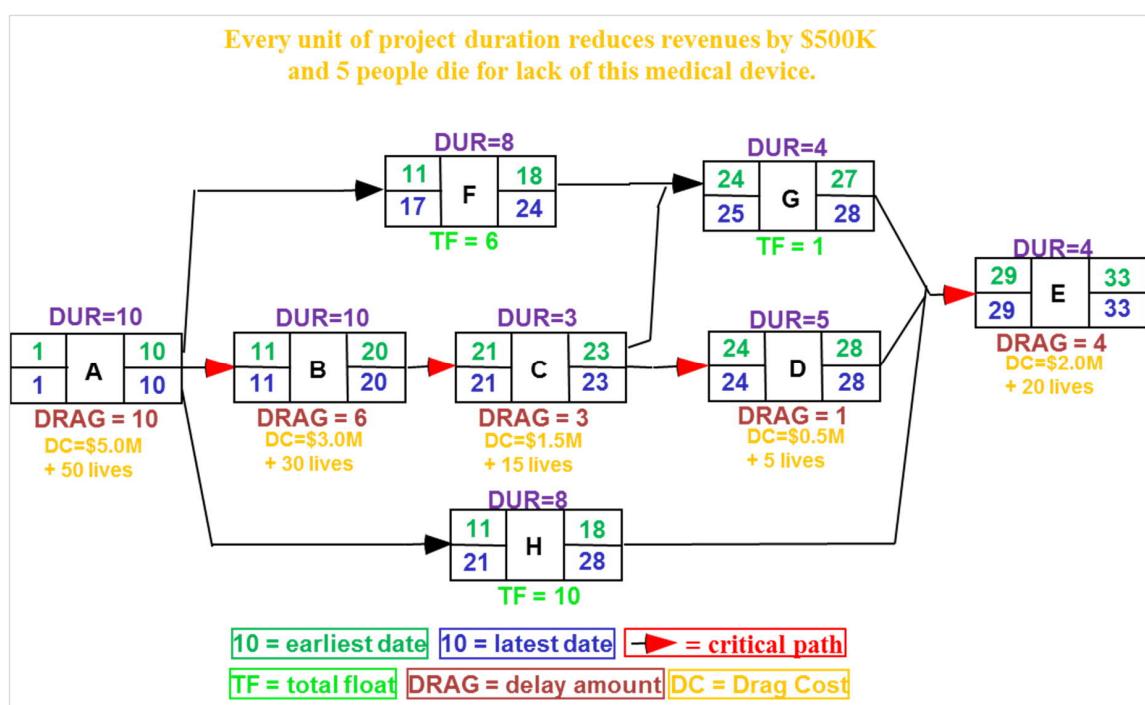


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[<http://orgmode.org>]

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Network logic diagram



Critical path, network logic diagram

In software development project, you may define a critical path, the order where several tasks should be done to allow smooth progress without delays. **And of course, you should have "Plan B" i.e. workaround.**

For example, at first the development environments should be installed and version control set up, with access rights to everyone. Make sure the licence is not ending during the project time. ;-)

Next CI/CD pipeline should be set up. Writing automated unit tests start.

If you need to buy new hardware, order those at once in the beginning, there may be some delays in shipment.

Find out customer's API documentation (if any exists...).

Schedule regular meetings with stakeholders.

At what point you should consider end-user involvement in testing prototypes ?

When you may start system testing at customer's site ?

Experience helps in project work, but all the time there are new co-workers involved, remember to help them.

Documentation and reporting

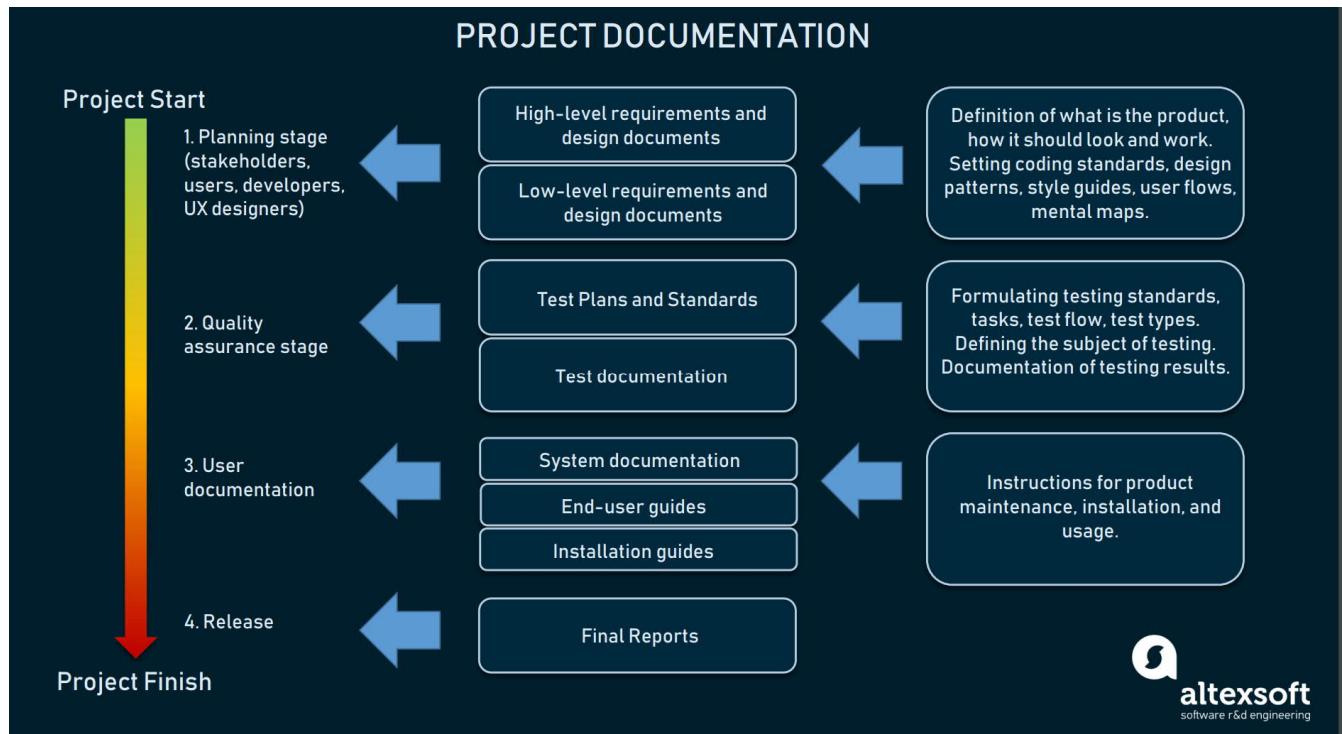
Some documentation hints

Project documentation is made for

- maintenance personnel (architectural diagrams, code comments,...)
- customer (requirements, test report,...)
- user (manual, handbook, quick reference guide, getting started video,...)
- project manager, company management (feasibility study, project plan, final report)
- what other stakeholders want (and are willing to pay for).

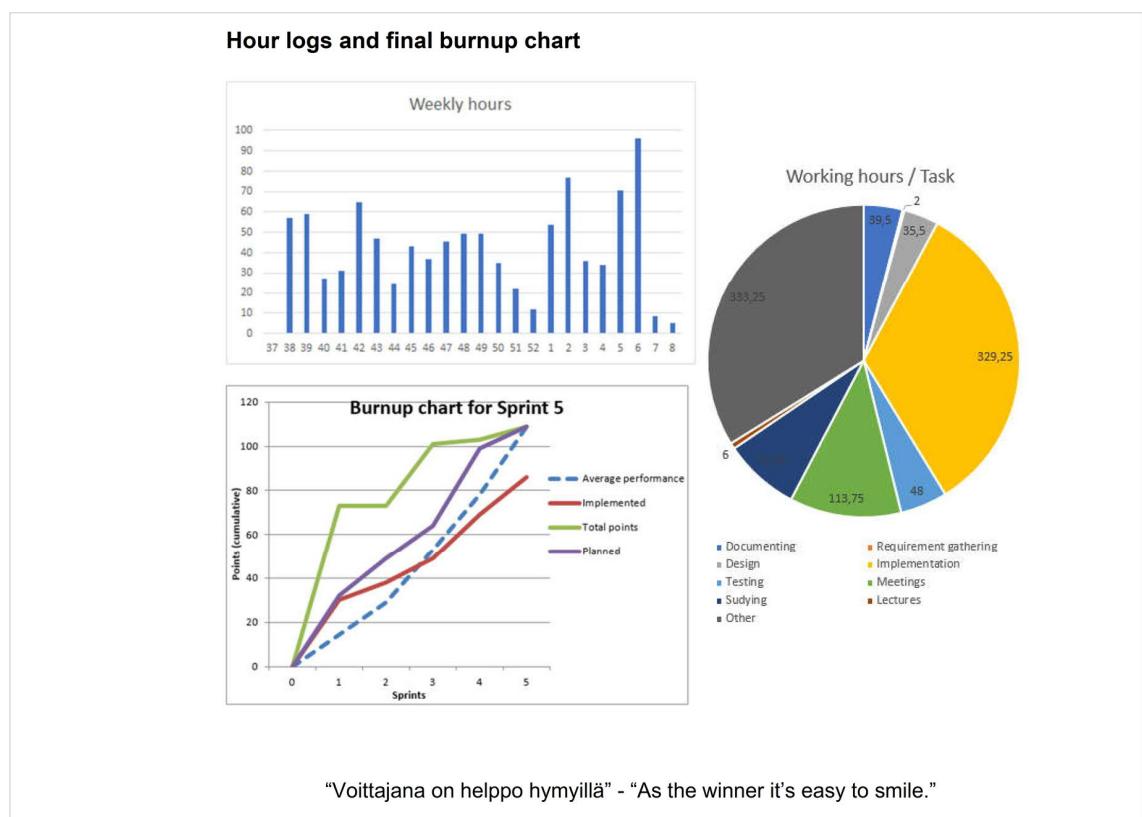
Usually ALL project documentation (even drafts and e-mails) are stored at least during software warranty period. Remember back-ups.

It has happened that after even over one year, old project documents have to be looked after. (lawsuit made by customer, but final decision was that developer was right)



Project reporting

- Reporting to **different organization layers** (e.g. management)
- Reporting to **different stakeholders** (e.g. customer)
- **Efficient reporting**
 - Notice to deviation – baseline is project plan
 - Supports to achieve targets and corrective actions
 - Content:
 - Project **status**
 - **Changes** to earlier report
 - **Implemented work** (e.g. last week)
 - **Planned work** (e.g. coming week)
 - Estimation about **work done/not done**
 - Estimation about **remaining workload**
 - **Needed decisions**
 - Updated **risk status**
 - **Traffic lights** (project result, resources, schedule).



"What is not on paper has not been said."



Some amount of documentation is needed in business cases.



Review of Test Data Indicates Conservatism for Tile Penetration

- The existing SOFI on tile test data used to create Crater was reviewed along with STS-87 Southwest Research data
 - Crater overpredicted penetration of tile coating significantly
 - Initial penetration described by normal velocity
 - Varies with volume/mass of projectile (e.g., 200ft/sec for 3cu. In)
 - Significant energy is required for the softer SOFI particle to penetrate the relatively hard tile coating
 - Test results do show that it is possible at sufficient mass and velocity
 - Conversely, once tile is penetrated SOFI can cause significant damage
 - Minor variations in total energy (above penetration level) can cause significant tile damage
 - Flight condition is significantly outside of test database
 - Volume of ramp is 1920cu in vs 3 cu in for test

"How PowerPoint destroyed Space Shuttle"

Patterns

Patterns, best practices

It is worth keeping eyes and ears open when meeting or discussing senior developers or project managers.

Like attending excursions, computing club seminars, or sauna party.

Many stories of failed software projects exists. Usually the technical matters had not been crucial reason for the failure. And in many cases there were more than just one failed detail.

Seldom there are articles about successful software projects.

But, if one pattern or process model worked well in your previous project, it may perhaps not work at the next one; application area, customer/developer, co-workers may be different.

patterns (best practices) [ISO 24765:2017]

3.1142 , design pattern

1. description of the **problem** and the essence of its solution to **enable the solution to be reused** in different settings.

Note 1 to entry: not a detailed specification, but a description of accumulated wisdom and experience.

- - -

In software engineering, a design pattern is a **general repeatable solution** to a commonly occurring problem in software design. A design pattern isn't a finished design that can be transformed directly into code. It is **a description or template** for how to solve a problem that can be used in many different situations.

[sourcemaking.com/design_patterns]

- - -

Design patterns are used to represent some of the **best practices** adapted by experienced object-oriented software developers. A design pattern systematically names, motivates, and explains a general design that addresses a recurring design problem in object-oriented systems. It **describes the problem, the solution, when to apply the solution, and its consequences**. It also gives implementation hints and examples.

[www.geeksforgeeks.org/software-design-patterns/]

Anti-pattern describes how NOT to do something, it is a "bad practice", problem source.

Finnish agile "war-story" pdf book

TTL:n Sytyke: [392 vuotta ketteriä kokemuksia](#), 02.05.2013, toinen painos, versio 2.0b2, kirja verkossa (pdf-tiedosto 97 sivua):

"Agile Finland ry:n järjestämä vuoden 2012 Scan Agile -konferenssi, jossa Dave Snowden kävi puhumassa. Avainviesti: jos seuraat ketterää menetelmää X, et ole ketterä. Menetelmäkohtaisista dogmeista olisi siis päästäävä seuraavalle tasolle: ymmärrettävä, miksi tietyllä tavalla kannattaa toimia ja missä tilanteissa kannattaa kokeilla mitäkin tekniikoita."

<http://www.sytyke.org/julkaisut/398-vuotta-ketteria-kokemuksia/>

Highlights - What to remember

- project work IS teamwork
- problems at projects are seldom technical ("hard"), but "soft"
- agree project guidelines, regulations and rules, and follow them
- help your teammates
- remember professional ethics
- be honest, give constructive feedback
- if you see problems in project, tell your superior/boss about them, don't hide
- understand that sometimes there are "slow flow" on your or groupmember's work
- sometimes it is good to use humour in difficult situations.

"Workload is not killing, it is challenging."

"Student's life is not always miserable, sometimes it is just a bad day."

Now the additional L9 extra slides are here

No time to show these at lectures, but otherwise good to know, at least if you are a major reader.

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Working in a project

11 Essential Skills of Managing Software Developers

Managing Software developers also require a few special management techniques to encourage their dynamic team's work efficiency and boost productivity by executing a successful customized product through well-planned project management.

The core part of these managing bodies to have a deep insight into leading a technical team effectively.



Project meetings

Characteristics of Facilitated Meetings

- Clear Purpose, Products, and Agenda
- Advanced Notification
- Right People - Prepared and Present
- Right information
- Timely Start
- Purpose and Products Reviewed
- Key Issues Identified
- Agenda Confirmed
- Ground Rules Reviewed
- Steady Meeting Flow
- Focused Discussion
- Positive, Energetic participation
- Constructive Conflict
- Thoughtful Decision-Making
- Decisions and Actions Reviewed
- Timely Finish
- Summary provided
- Follow-up on Actions

"Whistle blowing", (ethics = L02)

From group to teamwork

Team roles 1/3

Belbin's team roles are:



Shaper

- The Shaper is a **dynamic, outgoing member of the team**; they are often argumentative, provocative and impatient.
- These traits may mean that they cause friction with other, especially people-orientated, members of the group. Due to the personality of the Shaper they **push the group towards agreement and decision making, keen to remove barriers and embrace challenges**.

Implementer

- Implementers **get things done** – they have the ability of transforming discussions and ideas into practical activities.
- Implementers are conscientious, **wanting things to be done properly**. They are **very practical and organised in nature** hence their ability to get the job done. Implementers can be stuck in their ways, not always open to new ideas and way of doing things. Implementers would **rather stick to old, tried and tested methods** than to embrace change and innovation.

Completer-Finisher

- The Completer/Finisher is a **task-orientated member of the group** and as their name implies they **like to complete tasks**.
- The Completer/Finisher can be an anxious person **worried about deadlines and targets** – they are perfectionists and have good attention to detail but also worry about delegating tasks. They would **rather do something themselves** and know that it was done properly than delegate to somebody else.
- **Delegation can be a challenge** for many people, see our page Delegation Skills for more information.

Team roles 2/3



Coordinator/ Chairperson

- The Coordinator is **often a calm, positive and charismatic member** of the team.
- Coordinators **take on leadership or chairperson roles** by clarifying goals and objectives, helping to allocate roles, responsibilities and duties within the group. The Coordinator has **excellent interpersonal skills**, being able to communicate effectively with team members through good listening, verbal and non-verbal communication.

Team Worker

- The Team Worker **helps by giving support and encouragement to the other members** of the team.
- This team-oriented member is **concerned about how others in the team are managing**. Team Workers have sensitive, outgoing personalities and are happy to listen and act as the team counsellor.
- Team Workers are usually **popular members of the team**, able to effectively negotiate and work towards the good of the group. Team Workers can, however, be indecisive in group decisions – torn between the welfare of members and the ability of the team to deliver.

Resource Investigator

- The Resource Investigator is a **strong communicator, good at negotiating** with people outside the team and gathering external information and resources.
- Resource Investigators are **curious and sociable in their nature they are open to new ideas** and ways of accomplishing tasks. Being **flexible, innovative and open to change**, Resource Investigators are listened to by other team members. Sometimes, however, they are unrealistic in their optimism.

Team roles 3/3



Plant

- The Plant is an **intellectual and individualistic** member of the team.
- The Plant is **innovative and will suggest new and creative ways of problem solving** within the team. Sometimes the ideas of the Plant may be impractical due to their **highly creative nature** – they **may ignore known constraints** when developing their ideas. Plants are often introverts who may have poor communication skills, they are **loners and enjoy working away from the rest of the group**.

Monitor Evaluator

- The Monitor Evaluator is **unlikely to get aroused in group discussions** – they tend to be **clever and unemotional**, often detected from other members of the team.
- The monitor evaluator will **critically evaluate and analyse the proposals**, ideas and contributions of others in the team. Monitor Evaluators carefully weigh up advantages and disadvantages, strengths and weaknesses of ideas and proposals and therefore are usually good decision makers.
- Monitor evaluators are keen critical thinkers.

Specialist

- The Specialist has **expert knowledge in some area that is vital** to the success of the group.
- The specialist provides **knowledge and skills in this narrow area**. Dwelling on practicalities in their expert area the Specialist **may have problems applying their expertise to the wider goals** of the team. Specialists tend to be single-minded and professional.

Summary of Group Roles

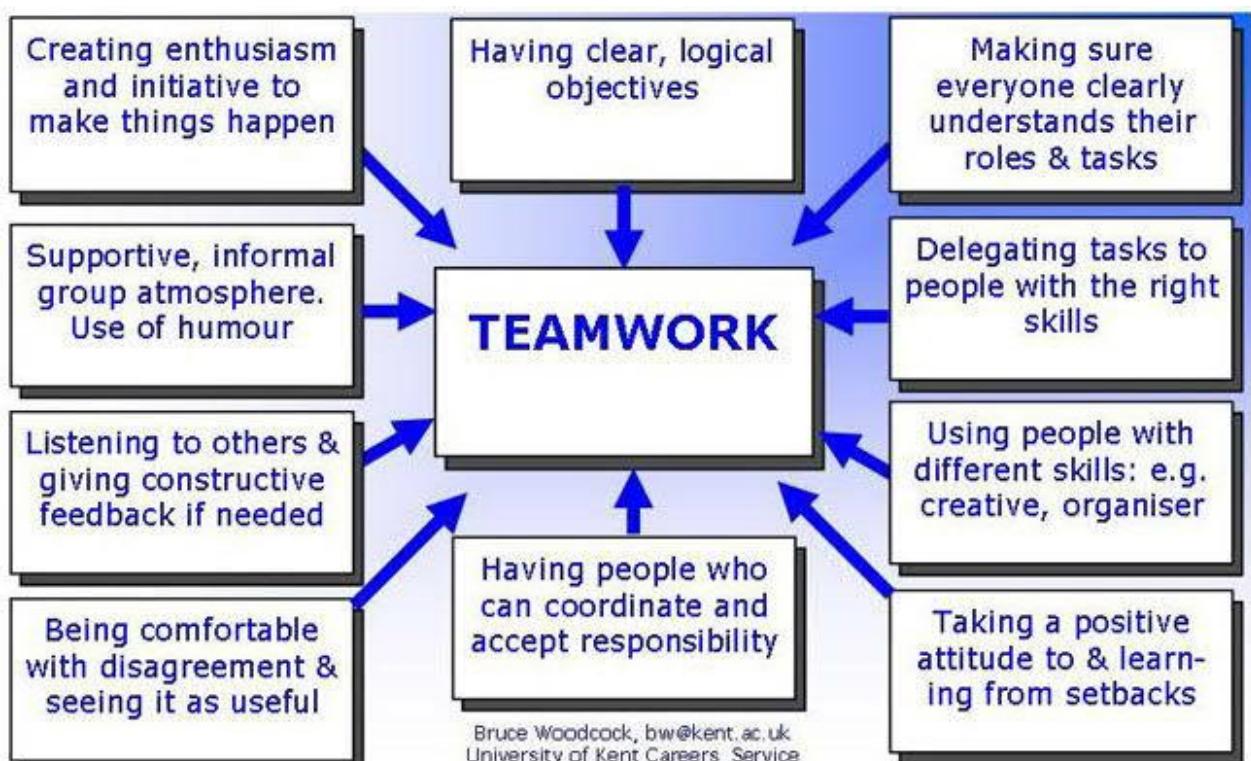
- It is perfectly **possible for people to adapt to different team roles at different times**. Although you may recognize your personality type in the descriptions above you will almost certainly adopt different roles in different scenarios. **Team roles often become more prevalent when a team or group has had time to reach maturity** and develop cohesiveness.

- The team members should feel free to express their perception and views; along with valuing the inputs provided by other members.
- The decision made should be a result of collective participation and contribution of all the team members.
- In a team, conflicts are usually treated as a source of information and generation of new ideas.
- The team members believe that they are together responsible for the execution of work or goal achievement; along with adherence to the established rules.
- There should be a higher degree of understanding among the team members. Such that, each one of them is aware of the weaknesses and strengths of other members, and can come forward for support whenever needed.
- In a team, the members have faith in the skills and competencies of one another. Thus, they support and boost the confidence of each other.
- The members efficiently apply their personal and professional skills to work towards the attainment of the team's goals.

Seven Principles of Developing a Group as a Team



[<https://theinvestorsbook.com/group-vs-team.html>]



Functional or dysfunctional team ?



Teamwork... manager's obstacle to success ??

Relationships between context factors

Every person is unique, with their own set of skills, preferences for workstyle, career goals, and learning styles.

Every team is unique not only because it is composed of unique people but also because it faces a unique situation.

Every organization is also unique, even when there are other organizations that operate in the same marketplace that you do.

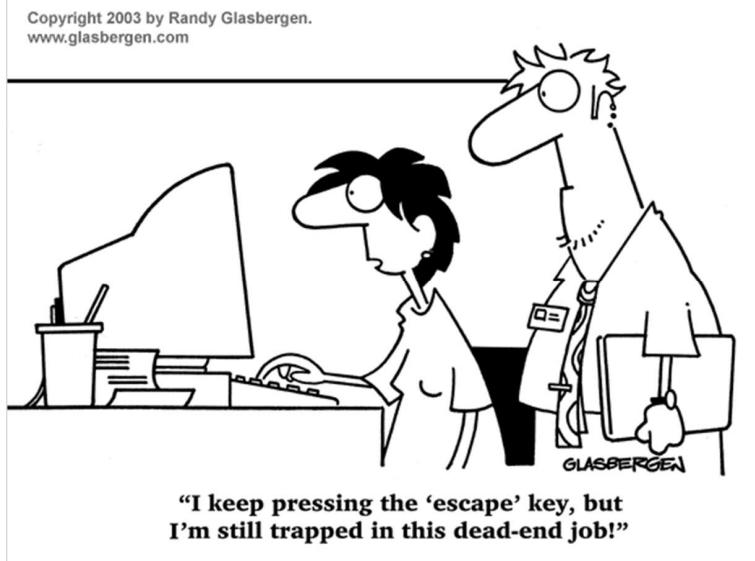
These observations – that people, teams, and organizations are all unique – leads to a critical idea that your process and organization structure must be tailored for the situation that you currently face. In other words, context counts.

Building a Team...

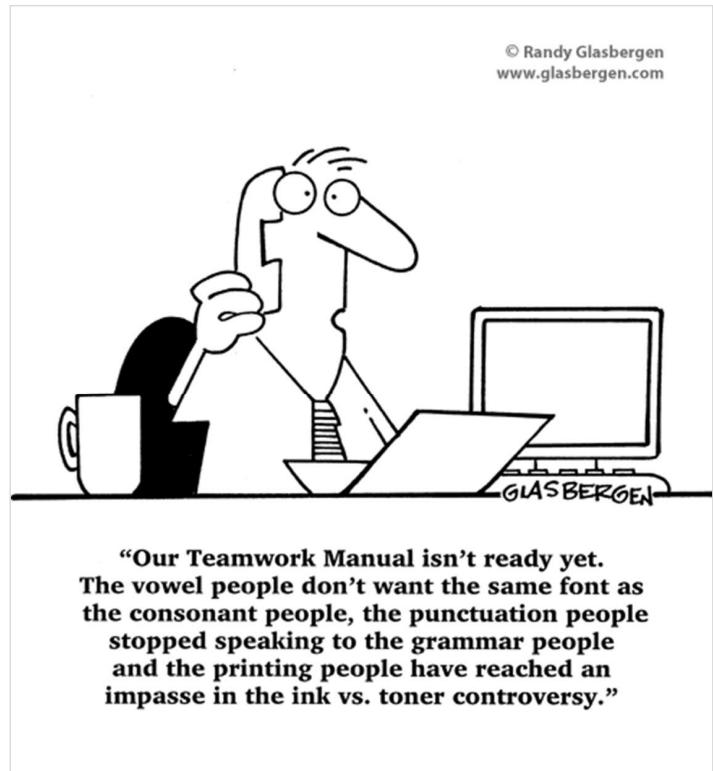


Team's goals would/should be above personal goals.

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www.glasbergen.com



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GROUP	VERSUS	TEAM
Group refers to a number of people who are connected by some shared activity, interest, or quality		Team refers to a number of persons associated together in work or activity
May not share a common goal		Share a common cause or goal
Specific roles and duties are not assigned to individuals		Specific tasks are assigned to each individual
Members are independent		Members are interdependent
Members may not know each other		Members are aware of each other's weaknesses

Pediaa.com

[<https://pediaa.com/difference-between-group-and-team/>]

Successful team... 1



- **Recognize the power of teamwork**
 - Take a moment to appreciate the power of teamwork and how you can best utilize this tool.
 - Consider the result you want and the tasks you think are required to achieve it.
 - As you think about your team members, match their skills to the tasks of the project, but also identify personalities you feel complement one another.
 - A successful team project maximizes the talents of its individual members, but the true power of teamwork comes from the group's cohesion and combined energies focused on a common goal.
- **Choose the right people**
 - If you want your team to be really effective, you'll need to get the right people for the job.
 - If, for example, you're trying to come up with a new way to communicate using new social media tools, then be sure to include all stakeholders.
 - Try to choose people for your team who together will provide a broad perspective on your project.
- **Authority and Responsibility**
 - Once you've got your team, make sure that everybody has the authority and access what the team needs to complete the project. Industrious, energetic, and creative people will become frustrated very quickly if they do not have the freedom, access to tools, and other resources they need to complete their work.
 - Avoid telling other members of a team what to do and how to do it. Instead, work with them to set goals, and then remove together obstacles and provide the support team needs to achieve their goals.
 - As project manager, your job becomes making sure they can do theirs.



- **Monitor progress**

- In an ideal world, you'll have exactly the right people in your team, and everything will take care of itself.
- In the real world, always have to verify that the team is working well together and that the project is on track. Provide, as necessary, a forum where team members can share concerns, successes, and project status on a regular basis.
- When a team identifies, addresses, and pushes through obstacles on its own, individuals draw closer together, and their success gives rise to confidence.

- **Celebrate your successes**

- When your team accomplishes or exceeds its goals, then be sure to celebrate it.
- At minimum, schedule a final team meeting where you can discuss collectively and describe the positive impact their work will have on you and your customer.
- One hallmark of an outstanding team is camaraderie. The team's success will build on itself, and your team and your organization will be the better for it as the team and as the individuals takes on more responsibility on future coming projects

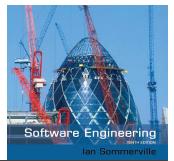
Framework based <http://www.inc.com/peter-economy/5-steps-to-really-effective-teams.html>

Teamwork



❖ Most software engineering is a group activity

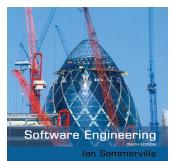
- The development schedule for most non-trivial software projects is such that they cannot be completed by one person working alone.
- ❖ A good group is cohesive and has a **team spirit**. The people involved are **motivated by the success of the group** as well as by their own personal goals.
- ❖ **Group interaction is a key determinant of group performance.**
- ❖ Flexibility in group composition is limited
 - Managers must do the best they can with available people.



Group cohesiveness

- ✧ In a cohesive group, **members consider the group to be more important than any individual in it.**
- ✧ The advantages of a cohesive group are:
 - Group **quality standards** can be developed by the group members.
 - Team members **learn from each other** and get to know each other's work; Inhibitions caused by ignorance are reduced.
 - **Knowledge is shared.** Continuity can be maintained if a group member leaves.
 - Refactoring and **continual improvement is encouraged.** Group members work collectively to deliver high quality results and fix problems, irrespective of the individuals who originally created the design or program.

Team spirit

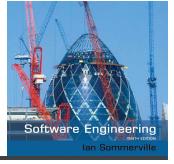


Alice, an experienced project manager, understands the importance of creating a cohesive group. As they are developing a new product, she takes the opportunity of involving all group members in the product specification and design by getting them to discuss possible technology with elderly members of their families. She also encourages them to bring these family members to meet other members of the development group.

Alice also arranges monthly lunches for everyone in the group. These lunches are an opportunity for all team members to meet informally, talk around issues of concern, and get to know each other. At the lunch, Alice tells the group what she knows about organizational news, policies, strategies, and so forth. Each team member then briefly summarizes what they have been doing and the group discusses a general topic, such as new product ideas from elderly relatives.

Every few months, Alice organizes an 'away day' for the group where the team spends two days on 'technology updating'. Each team member prepares an update on a relevant technology and presents it to the group. This is an off-site meeting in a good hotel and plenty of time is scheduled for discussion and social interaction.

The effectiveness of a team



❖ The people in the group

- You need a **mix of people** in a project group as software development involves diverse activities such as negotiating with clients, programming, testing and documentation.

❖ The group organization

- A group should be organized so that individuals can **contribute** to the best of their abilities and tasks can be completed as expected.

❖ Technical and managerial communications

- **Good communications** between group members, and between the software engineering team and other project stakeholders, is essential.

Dimensions of project roles

- **Look up** (Ensure that management is engaged)
- **Look out** (Ensure that project reflects customers, end-users, etc. expectations)
- **Look forward** (Plan & ensure that project group sets realistic targets and have resources to achieve those)
- **Look forward** (Plan & ensure that project group sets realistic targets and have resources to achieve those)
- **Look down** (Lead the team. Maximize team's performance through individuals)
- **Look inside** (Lead yourself by evaluating your work. Make sure that your contribution gives added value to project)
- **Look back** (Follow progress with relevant tools and so ensure that project will achieve targets and team is learning from mistakes)

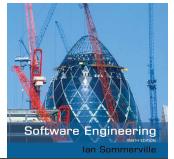
Project
Manager
role



- **Look up** (Ensure that Project manager supports your work)
- **Look out** (Ensure that your work results are following the plan (time spend, results, quality))
- **Look forward** (Plan & ensure that you have realistic targets and you will have needed resources to achieve those)
- **Look around** (Try to improve your team's performance by supporting others.)
- **Look inside** (Lead yourself by evaluating your work. Make sure that your contribution gives added value to project)
- **Look back** (Follow your progress with agreed tools and ensure that you will achieve your individual targets and you are learning from your mistakes)

Project
team
member
role



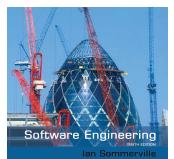


Selecting group members

- ✧ A manager or team leader's job is to create a cohesive group and organize their group so that they can work together effectively.
- ✧ This involves creating a group with **the right balance of technical skills and personalities**, and organizing that group so that the members work together effectively.

However, very seldom project manager can pick "the best selection" of company workers to his/her project. Usually it is just those who are available at the moment for a new project.

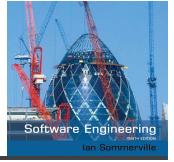
Assembling a team



- ✧ May not be possible to appoint the ideal people to work on a project
 - Project budget may not allow for the use of highly-paid staff;
 - Staff with the appropriate experience may not be available;
 - An organisation may wish to develop employee skills on a software project.
- ✧ Managers have to work within these constraints especially when there are shortages of trained staff.

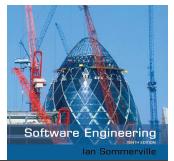
For example, TUNI Hervanta (= technical, ex-TUT) students would surely get a mobile game project done. But it would be a "disposable" game (play once and forget). With groupmembers also from other campuses the game would be better.

Group composition

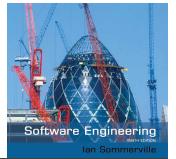


- ✧ Group composed of members who share the same motivation can be problematic
 - Task-oriented - everyone wants to do their own thing;
 - Self-oriented - everyone wants to be the boss;
 - Interaction-oriented - too much chatting, not enough work.
- ✧ **An effective group has a balance of all types.**
- ✧ This can be difficult to achieve software engineers are often task-oriented.
- ✧ Interaction-oriented people are very important as they can detect and defuse tensions that arise.

Group organization



- ✧ The way that a group is organized affects the decisions that are made by that group, the ways that information is exchanged and the interactions between the development group and external project stakeholders.
 - Key questions include:
 - Should the project manager be the technical leader of the group?
 - Who will be involved in making critical technical decisions, and how will these be made?
 - How will interactions with external stakeholders and senior company management be handled?
 - How can groups integrate people who are not co-located?
 - How can knowledge be shared across the group?



Group organization

- ✧ Small software engineering groups are usually organised **informally** without a rigid structure.
- ✧ For large projects, there may be a hierarchical structure where different groups are responsible for different sub-projects.
- ✧ Agile development is always based around an informal group on the principle that formal structure inhibits information exchange.

Tensu: I do not believe in self-organising and self-managed project groups.

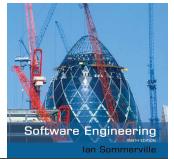
Informal groups



- ✧ The group acts as a whole and comes to a **consensus** on decisions affecting the system.
- ✧ The group leader serves as the external interface of the group but does not allocate specific work items.
- ✧ Rather, work is discussed by the group as a whole and tasks are allocated according to ability and experience.
- ✧ **This approach is successful for groups where all members are experienced and competent.**

Agile methods are supposed to be used by experienced teams only.

Group communications



- ✧ **Good communications are essential for effective group working.**
- ✧ Information must be exchanged on the **status of work**, design **decisions** and **changes** to previous decisions.
- ✧ Good communications also strengthens group cohesion as it promotes understanding.

Face-to-face (F-2-F) meetings "around the same table" are much better than e-mail.

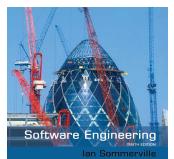
Groups should agree which communication channels they use, and how. Agree also how to use e-mail Subject line text (e.g. for important matters).

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Group communications



- ✧ Group size
 - **The larger the group, the harder it is for people to communicate with other group members.**
- ✧ Group structure
 - Communication is better in informally structured groups than in hierarchically structured groups.
- ✧ Group composition
 - Communication is better when there are different personality types in a group and when groups are mixed rather than single sex.
- ✧ The physical work environment
 - Good workplace organisation can help encourage communications.

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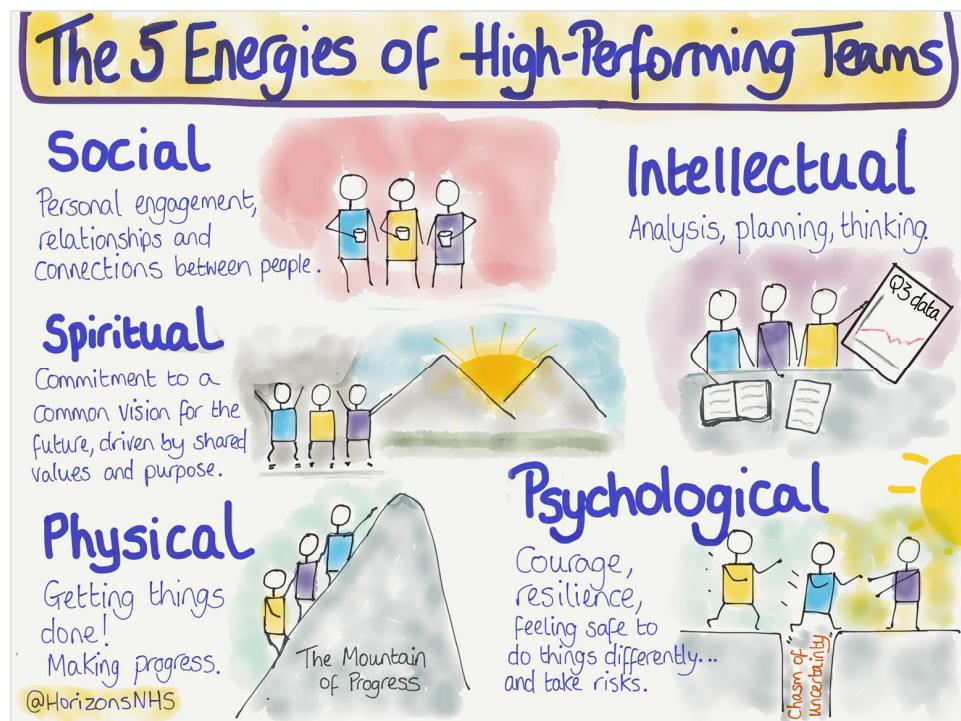
"This isn't the triple constraint I learned."

10 Things FAB TEAMS Do! They...

1. Create a shared VISION of the future, and move towards it together.
 2. Challenge the status quo together, so no one has to face scary change alone.
 3. Sign up to... (change is built on a commitment to a different future, not performance management).
 4. Value and embrace difference and healthy conflict.
 5. Help everyone in the team to feel safe and innovate.
 6. Communicate → TALK! (Don't rely on email)
 7. Are KIND to each other. Get to know each other as people - care about the little things (like tea + cake!).
 8. Think the best of each other - so when something goes wrong you don't blame other people's incompetence.
 9. Achieve Win-Win for all team members
 10. Are highly productive - the sum is greater than its parts.
- @HorizonsNHS**

[<https://twitter.com/cspramesh/status/966487540994785280>]

[<https://nhshorizons.passle.net/>]



1 PEOPLE own what they HELP CREATE
We create spaces where people with a diversity of views and experiences can come together and co-create the future so we get...
BETTER, QUICKEr OUTCOMES

2 REAL CHANGE takes place in REAL WORK
We support the frontline staff who do the work to share ideas, experience and operational practise to speed up...
LEARNING ACTION & CHANGE

3 The people who do the work do the CHANGE
We help people, staff and patients to build their **POWER** to make a difference

4 CONNECT the system to more of itself
We connect thousands of people to each other, through social networks, virtual communities and social media

The HORIZONS TEAM

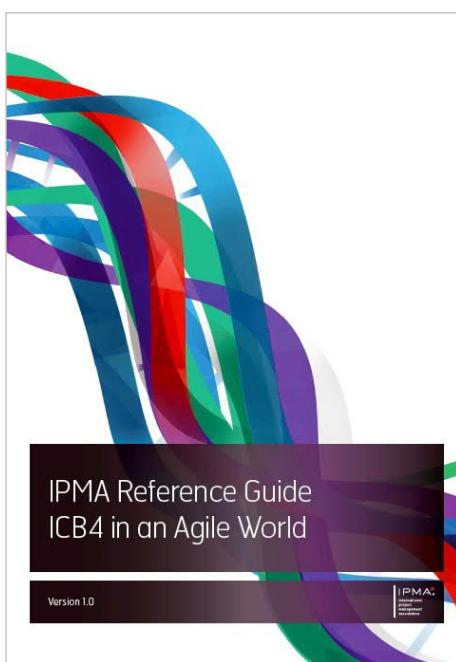
This is what we do

Principles taken from Myron Rogers: "Myron's Maxims"

IPMA ICB4, individual competence baseline

IPMA =
International
Project
Management
Association

"European PM"



	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
Perspective	Strategy	Governance, Structures and Processes	Compliance, Standards and Regulations	Power and Interest	Culture and Values	
People	Self-reflection and Self-management	Personal Integrity and Reliability	Personal Communication	Relations and Engagement	Leadership	Teamwork
Practice	Conflict and Crisis	Resourcefulness	Negotiation	Results orientation	Design	
					Goals and requirements	
					Scope	
					Time	
					Organisation and Information	
					Quality	
					Finance	
					Resources	
					Procurement	
					Plan and Control	
					Risk and Opportunity	
					Stakeholders	
					Change and Transformation	

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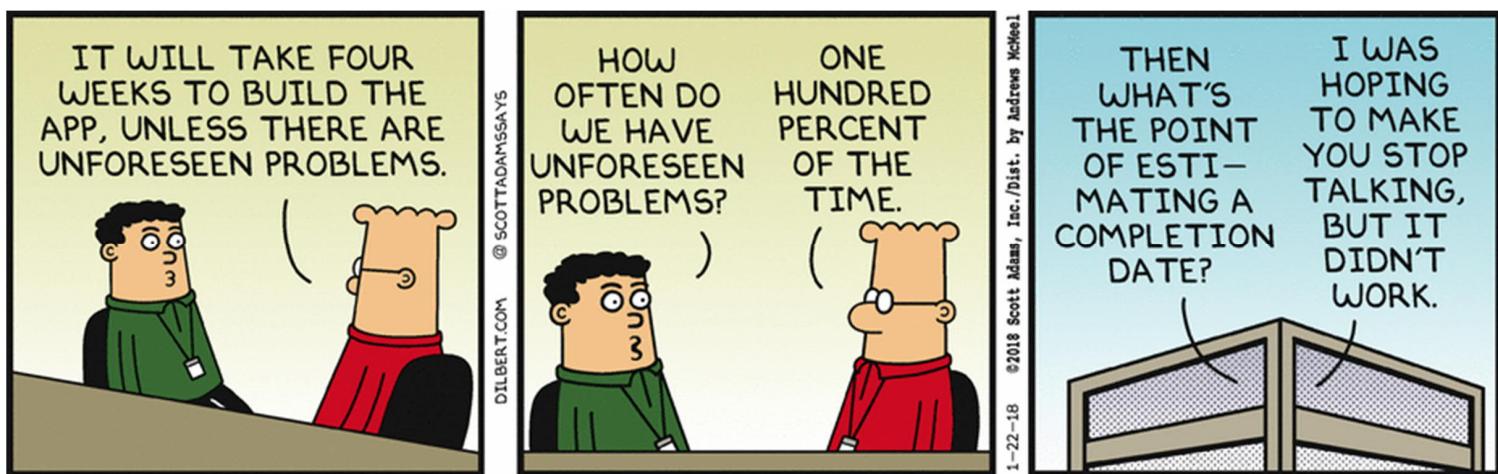
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Common problems

Possible conflicts in groups

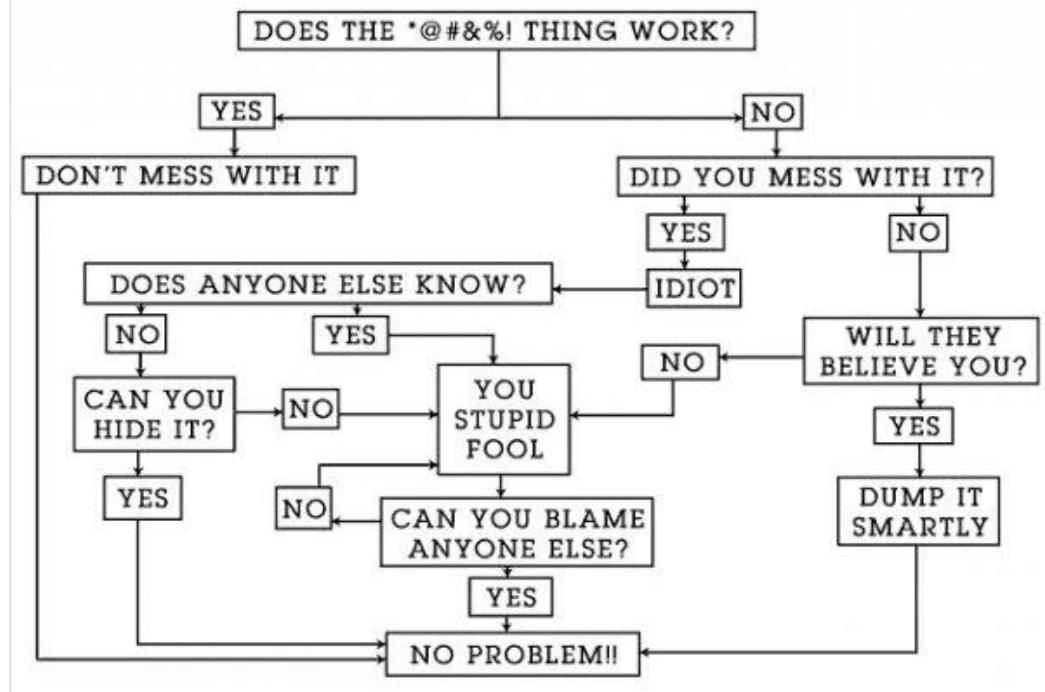
- Somebody may work less than others, others may think (s)he is a "free-rider". But you have agreed average personal weekly working hours promises in start at Project Plan. It is OK to have different amount of working hours, if that is agreed within the whole group.
- There may be some interpersonal problems, perhaps different working habits or cultural differences, or most likely misunderstandings. **Solve all issues right away within your group.**

Well, there will **ALWAYS** come surprises... hopefully not big ones...



PROBLEM SOLVING FLOWCHART

Discuss about work problems with your colleagues, sometimes you discover the answer when you explain the problem to someone.



Folklore: you learn well from your own mistakes, but smart people learn from others' mistakes

(FI: omista virheistään oppii hyvin, mutta fiksumpaa olisi oppia toisten virheistä.)

A MISTAKE IS
ONLY A MISTAKE
IF YOU DON'T
LEARN FROM IT.



COMMON MISTAKES PROJECT MANAGERS MAKE:



Failing To Break It Down - A project is far more manageable if it's broken into smaller sections. Approaching a team with a large, complex project plan without any direction of the steps to take in order to complete will overwhelm them.



Not Communicating Enough - Communication is essential to make sure that the project is progressing in a way that meets everyone's expectations. Set up regular meetings to ensure that people keep on track.



Being Too Rigid - Setting a plan and sticking to it is all very well, but failing to adapt to the changes you will inevitably run into as your project progresses will leave you with a project that runs over deadline and doesn't meet expectations.



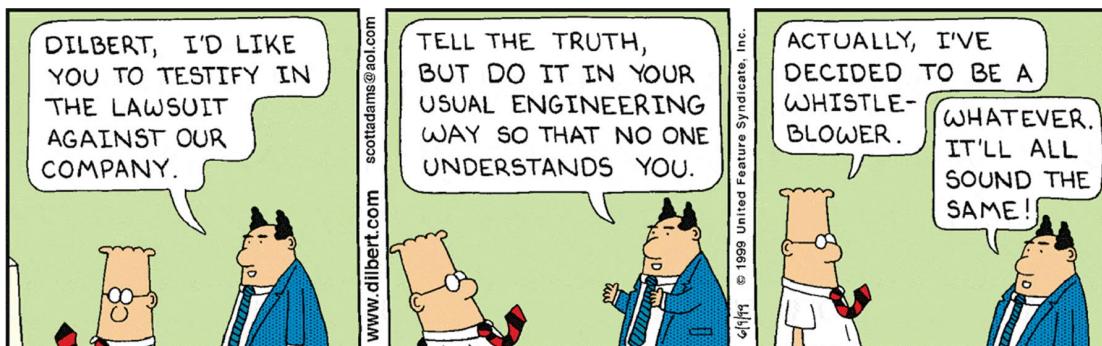
Being Unclear About Requirements - A project involves turning an ambitious idea into a working reality. Starting a project without being 100% clear on the requirements is a recipe for disaster. Save yourself time and money by making sure you have clearly established the project requirements.



Being Unaware Of The Team's Strengths and Weaknesses - A good project manager will choose their team based on their ability to work efficiently and to a high standard. Knowing their strengths and weaknesses will help you to put together the most evenly balanced team possible who are able to deliver the results you need.

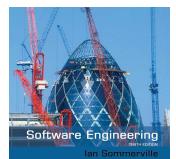


[<https://www.theknowledgeacademy.com/blog/the-skills-and-values-of-efficient-project-managers/>]



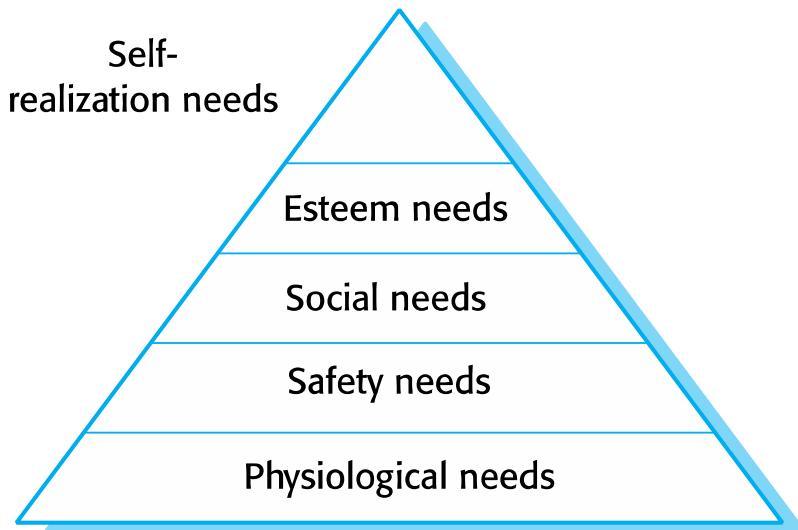
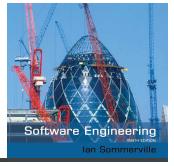
Soft skills

Motivating people



- ✧ An important role of a manager is to **motivate** the people working on a **project**.
- ✧ Motivation means organizing the work and the working environment to **encourage people to work effectively**.
 - If people are not motivated, they will not be interested in the work they are doing. They will work slowly, be more likely to make mistakes and will not contribute to the broader goals of the team or the organization.
- ✧ Motivation is a complex issue but it appears that there are different types of motivation based on:
 - Basic needs (e.g. food, sleep, etc.);
 - Personal needs (e.g. respect, self-esteem);
 - Social needs (e.g. to be accepted as part of a group).

Human needs hierarchy

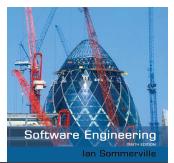


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Need satisfaction

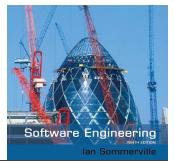


- ✧ In software development groups, basic physiological and safety needs are not an issue.
- ✧ **Social**
 - Provide communal facilities;
 - Allow **informal communications** e.g. via social networking
- ✧ **Esteem**
 - **Recognition** of achievements;
 - Appropriate **rewards**.
- ✧ **Self-realization**
 - **Training** - people want to learn more;
 - Responsibility.

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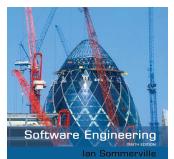
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Personality types

- ✧ The needs hierarchy is almost certainly an over-simplification of motivation in practice.
- ✧ **Motivation should also take into account different personality types:**
 - **Task-oriented** people, who are motivated by the work they do. In software engineering.
 - **Interaction-oriented** people, who are motivated by the presence and actions of co-workers.
 - **Self-oriented** people, who are principally motivated by personal success and recognition.

Personality types

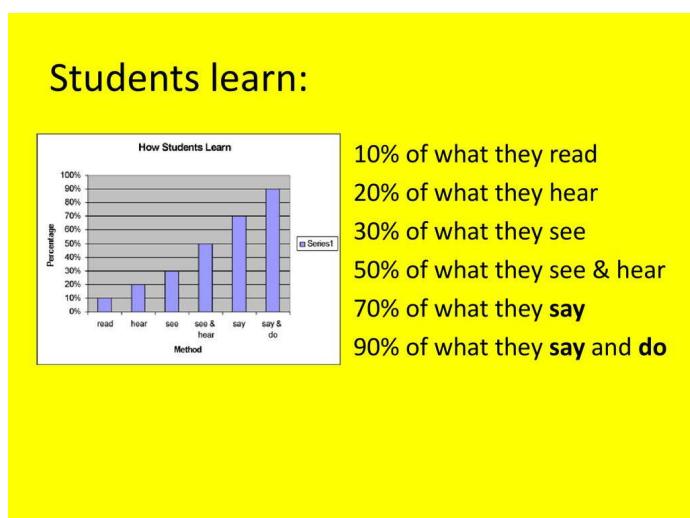


- ✧ Task-oriented.
 - The motivation for doing the work is the work itself;
- ✧ Self-oriented.
 - The work is a means to an end which is the achievement of individual goals - e.g. to get rich, to play tennis, to travel etc.;
- ✧ Interaction-oriented
 - The principal motivation is the presence and actions of co-workers. People go to work because they like to go to work.

Motivation

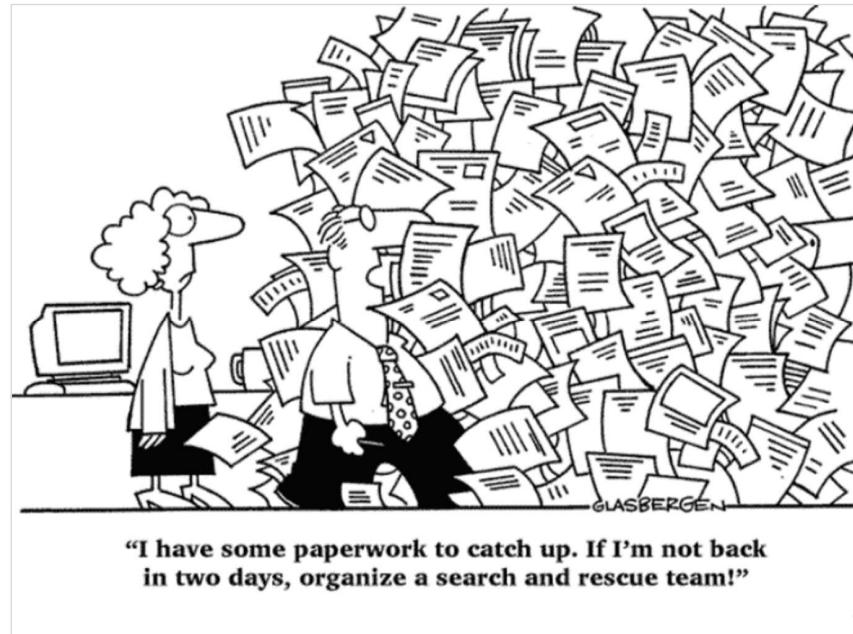


"This isn't the triple constraint I learned."



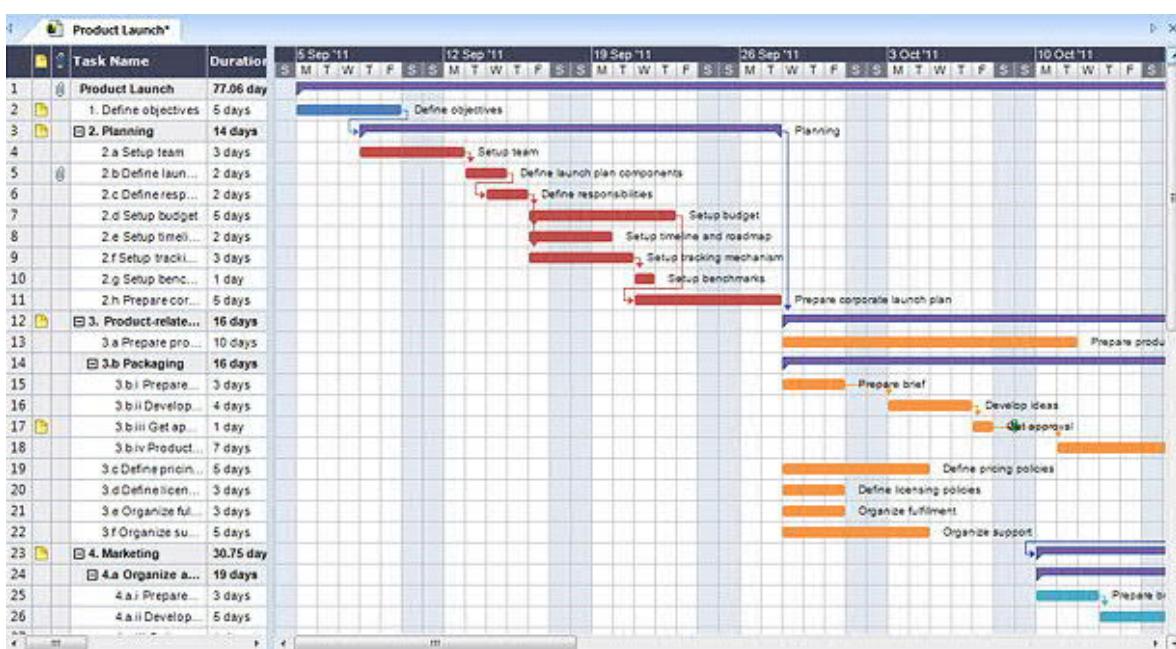
I Remember...

- 5% of what I hear
- 10% of what I read
- 20% of what I hear and read
- 30% of what I am shown
- 50% of what I discuss
- 75% of what I do
- 90% of what I teach others



Tools

Gantt diagram 1



[<http://www.matchware.com>]

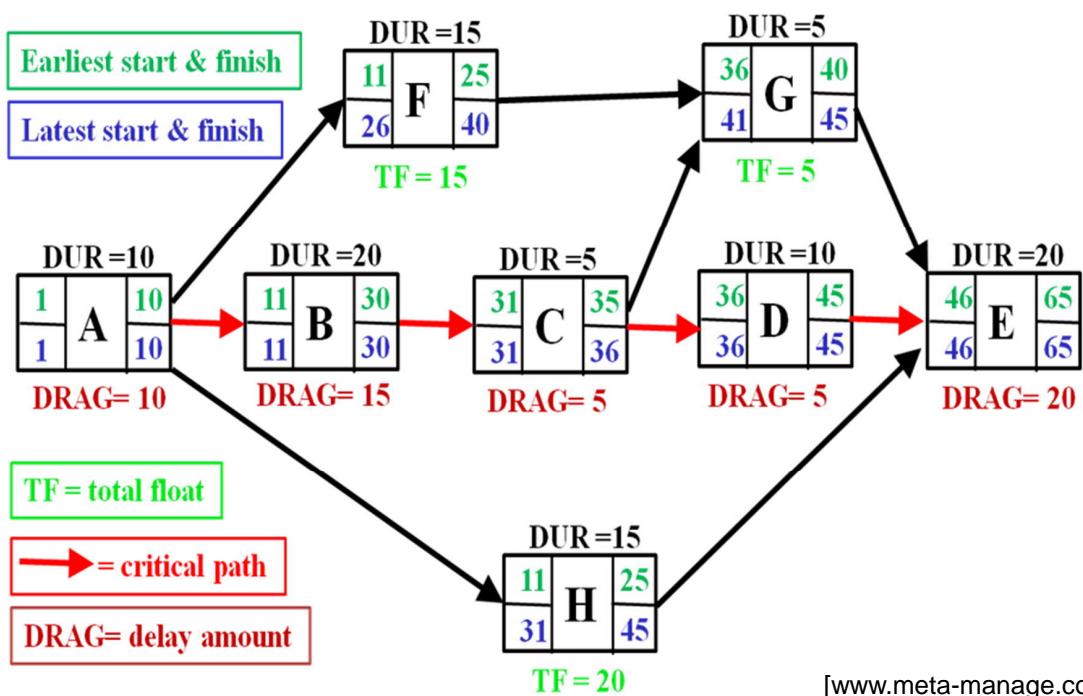
Gantt diagram, 2



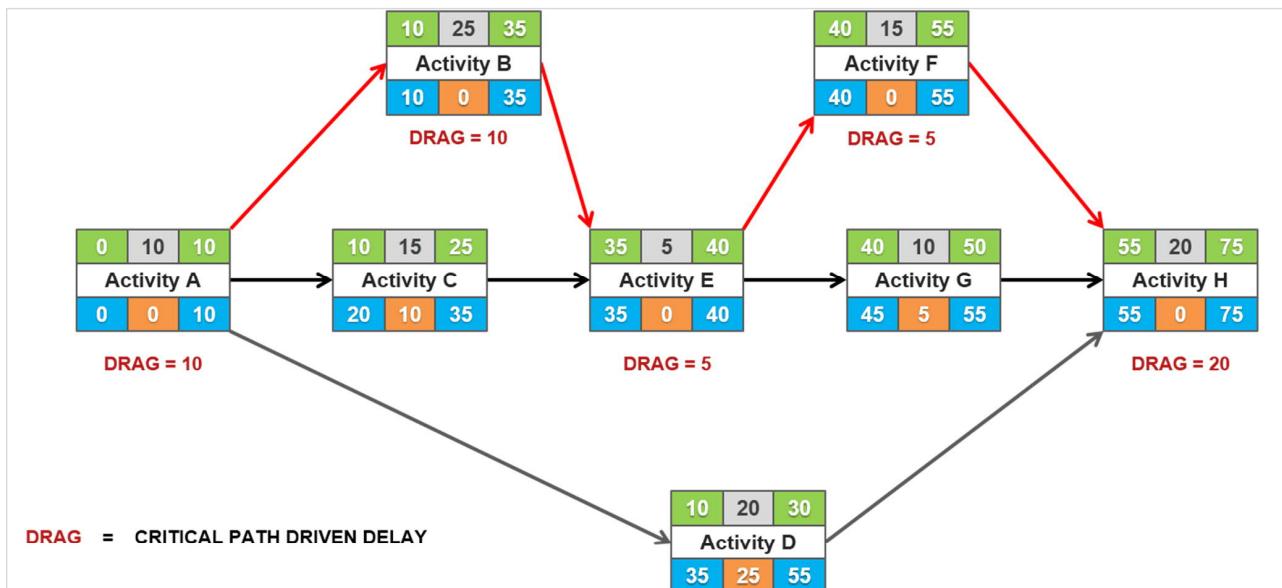
Diagrams only show the data you have inserted.

[www.officetimeline.com]

Critical Path



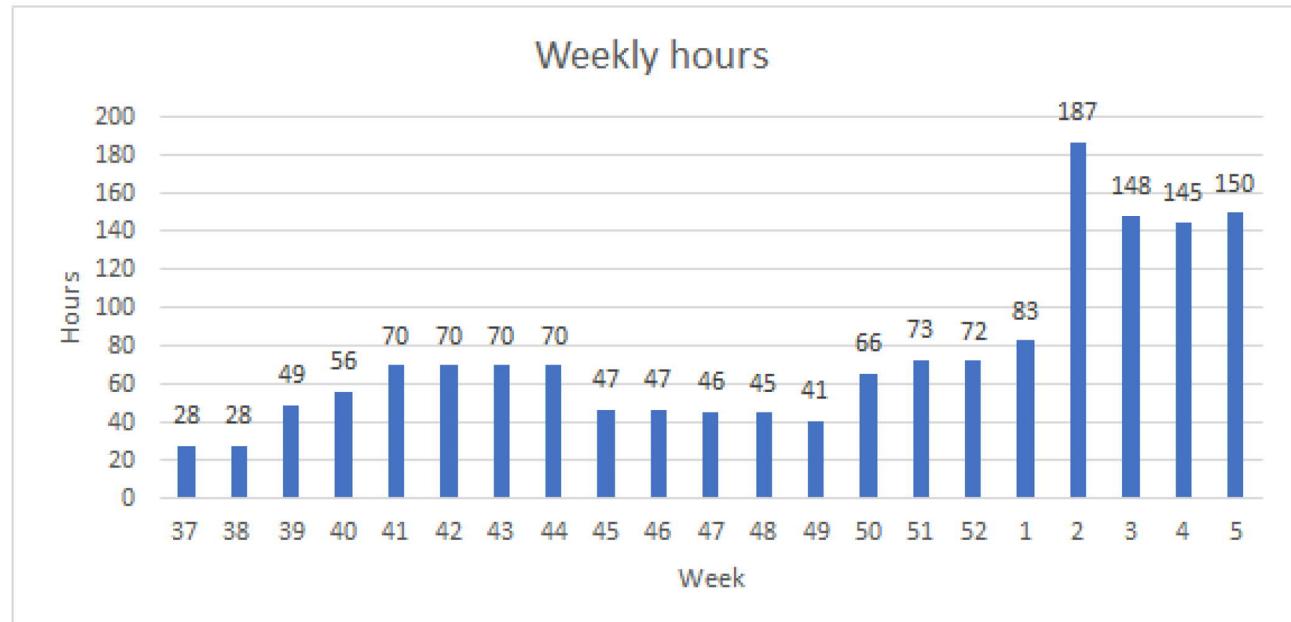
[www.meta-manage.com]



[<https://www.project-risk-manager.com/blog/pert-vs-cpm/>]



Documentation and reporting



Picture 8: Bar chart of weekly working hours.

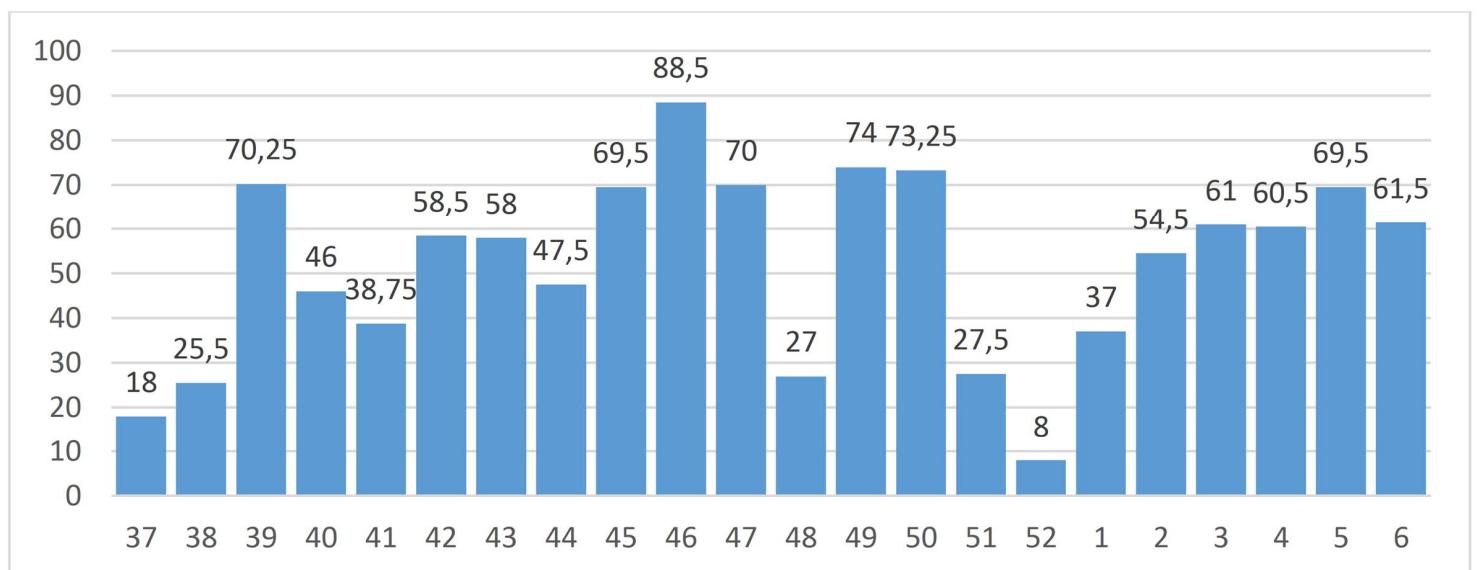
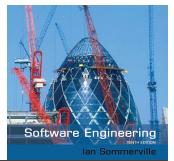


Figure 2: hours per week



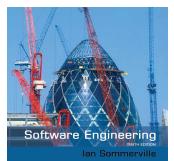
Project activities

❖ Project activities (**tasks**) are the basic planning element. Each activity has:

- a **duration** in calendar days or months,
- an **effort estimate**, which shows the number of person-days or person-months to complete the work,
- a **deadline** by which the activity should be complete,
- a **defined end-point**, which might be a document, the holding of a review meeting, the successful execution of all tests, etc.

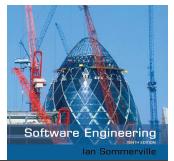
At least some "Lessons learnt" or Final Report should be written from every project. Even just a one-page length text about what went well and why ("best practices"), as well as problems with solutions. So that future projects could learn from yours.

Milestones and deliverables



- ❖ **Milestones** (FI: *etappi*) are points in the schedule against which you can assess progress, for example, the handover of the system for testing.
- ❖ **Deliverables** (FI: *vaihetuote*) are work products that are delivered to the customer, e.g. a requirements document for the system.

Those should be clearly stated and measurable (DoD).



Tasks, durations, and dependencies

Task	Effort (person-days)	Duration (days)	Dependencies
T1	15	10	
T2	8	15	
T3	20	15	T1 (M1)
T4	5	10	
T5	5	10	T2, T4 (M3)
T6	10	5	T1, T2 (M4)
T7	25	20	T1 (M1)
T8	75	25	T4 (M2)
T9	10	15	T3, T6 (M5)
T10	20	15	T7, T8 (M6)
T11	10	10	T9 (M7)
T12	20	10	T10, T11 (M8)

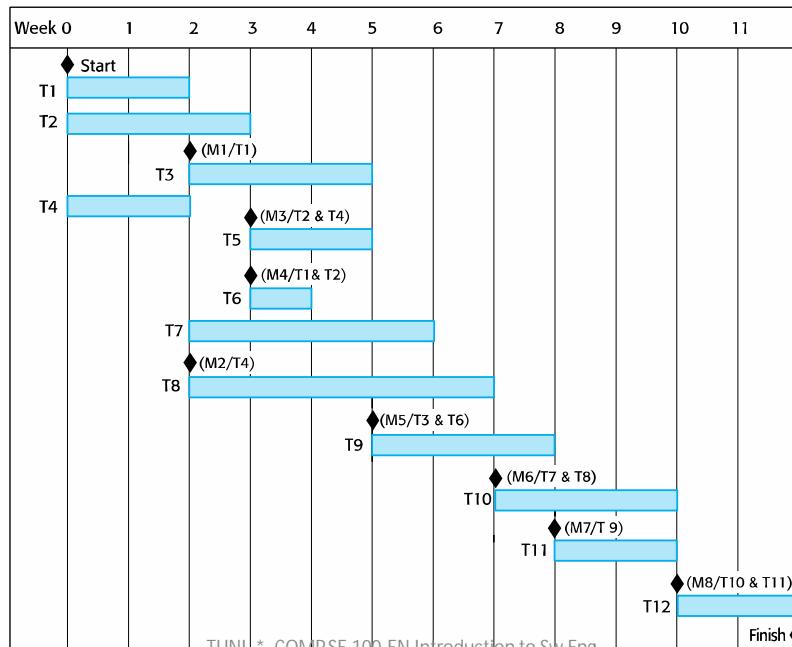
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Activity bar chart

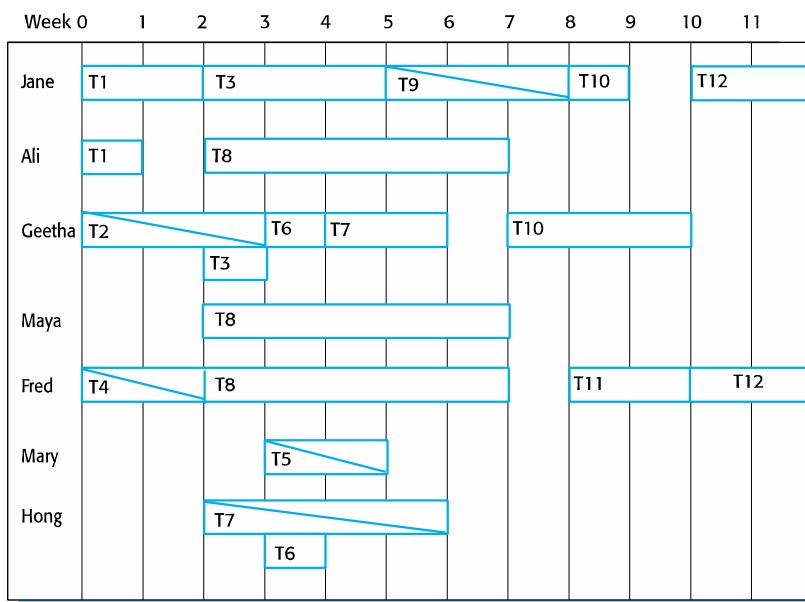
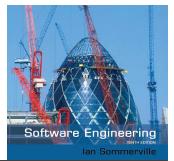


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Staff allocation chart



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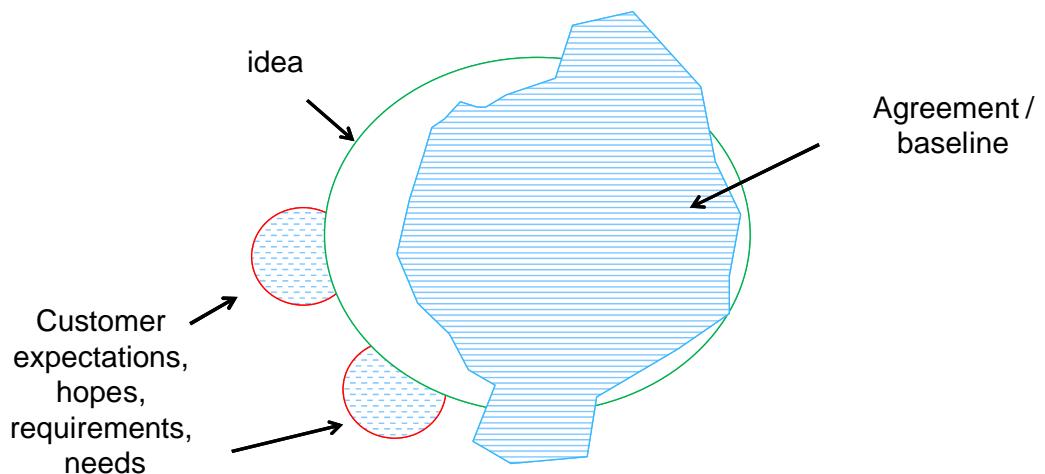
Project targets and definition of results

- Project targets and results needs to be **SMART**
 - Specific (täsmällinen)
 - Measurable (mitattava)
 - Attainable (saavutteissa oleva)
 - Realistic (realistinen)
 - Time-limited (aikaan sidottu)
- It might be useful to use iterative way of working in preparation and to clear project target(s).
- "You can not expect people to succeed and committed in project, where they don't know what are expected from them."

S pecific
M easurable
A chievable
R elevant
T ime-based



Containment of project target and results



Project targets and definition of results

- Project targets and results needs to be **SMART**
 - **Specific** (täsmällinen)
 - **Measurable** (mitattava)
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- "You can not expect people to succeed and committed in project, where they don't know what are expected from them."



Project reporting

- Reporting to **different organization layers** (e.g. mgmt)
- Reporting to **different stakeholders** (e.g. customer)
- **Efficient reporting**
 - Notice to deviation – baseline is project plan
 - Supports to achieve targets and corrective actions
 - Content:
 - Project **status**
 - **Changes** to earlier report
 - **Implemented work** (e.g. last week)
 - **Planned work** (e.g. coming week)
 - Estimation about **work done/not done**
 - Estimation about **remaining workload**
 - **Needed decisions**
 - Updated **risk status**
 - **Traffic lights** (project result, resources, schedule)



Patterns

Some organisations, common knowledge

- IPMA = International Project Management Association ("european")
- PMI = Project Management Institute ("american")
- SEI = Software Engineering Institute
- IEEE = Institute of Electrical and Electronics Engineers [I-triple-E]
- PRY = Projekti(työ)yhdistys www.pry.fi
- Tivia = ex-Tietotekniikan liitto www.tivia.fi

Some general well-known links

- <http://www.ipma.ch/>
IPMA - International Project Management Association
- <http://www.pmi.org/>
Project Management Institute, Inc.
- <http://www.apm.org.uk/>
Association for Project Management
- <http://www.ieee.org/>
IEEE, pronounced "Eye-triple-E," stands for the Institute of Electrical and Electronics Engineers.
- <http://www.sei.cmu.edu/>
Software Engineering Institute (SEI) Carnegie Mellon University

Some books you may find or buy from the internet

- A Guide to the Project Management Body of Knowledge (PMBOK Guide), 5th ed., 2013.
6th ed. 2017.
- Guide to the Systems Engineering Body of Knowledge (SEBoK), version 2.2, 2019.
- APM Body of Knowledge, 5th edition, 2006.
7th edition 2019.

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**"My presentation lacks power and it has no point.
I assumed the software would take care of that!"**

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**"Your presentation was thought-provoking.
I thought you'd never shut up. I thought
I might die of boredom. I thought about
smashing your projector with my shoe..."**